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SURGICAL CLINICS OF CHICAGO

Volume 3 Number 6

CLINIC OF DR ARTHUR DEAN BEVAN

PRESBYTERIAN HOSPITAL

CHRONIC LUNG ABSCESS WITH FISTULA—TREATMENT BY EXCISION

Summary Results of operations for drainage of lung abscess—difficulty of effecting cure of postoperative fistulas—available measures technic of excision of abscess under local anesthesia

THE patient I shall operate on this morning has the following history He was an officer in the United States Army during the war, and while in the service developed pneumonia, which resulted in the formation of a lung abscess This case has already been reported in the Surgical Clinics of Chicago, October, 1918, page 921 Briefly, however, the facts are these After his pneumonia he did not recuperate and developed what was regarded as empyema on the left side He was operated upon by a surgeon in Colorado and an incision was made between the seventh and eighth ribs in the axillary line on the left side, and the pleura opened The surgeon was astonished to find no pus and a collapsible lung Pneumothorax developed immediately, and the surgeon did what proved to be a very wise thing He made an immediate closure of the wound without drainage The operative pneumothorax disappeared within a few days, the air being completely absorbed The patient s general condition, however did not improve He ran a septic temperature for a number of weeks sometimes as high as 104° F He coughed up some very foul material and was finally brought to the Presbyterian Hospital

He was kept under observation for several weeks more before we located fairly definitely the abscess of the lung This we opened by the method which we employ in [illegible]

under local, finding the abscess with a needle, making a fair sized canal with the electric cautery into the abscess and introducing a rubber drainage tube through this canal. He recovered from the operation and improved very much. After he had gained 10 or 15 pounds in weight and was entirely free of fever, I attempted to obliterate the abscess with bismuth paste. I injected probably ½ dram through the tube, and this was followed by a very violent fit of coughing. The patient coughed up some bismuth paste, showing that the abscess cavity communicated directly with a bronchus. The injection of even ½ dram of paste did him a great deal of damage for a few days. It was followed by a sharp rise in temperature. This however, finally subsided, and he got rid of all the bismuth either by coughing it up or expelling it through the rubber tube in the fistula. I then *decided simply to drain the abscess with a drainage-tube* for a long time and sent him to California for the winter. While in California he picked up weight and strength and improved until his general condition was excellent. He began, however, to have disturbance with the drainage-tube and there was a very free discharge of mucopus from the tube varying in amount from day to day, sometimes very free and sometimes quite scanty.

During this period of a number of months while he was under observation I took several *x*-ray pictures of his chest, which showed a damaged triangular area of the left lower lobe, between the diaphragm, chest wall, and pericardium. I also examined his chest with the fluoroscope and found that I could pass a probe through the fistulous tract into a small abscess cavity and then into the bronchus. When the probe entered the bronchus it would produce a very violent fit of coughing associated with the coughing up *of some blood*. *Bacteriologic examination* of the sputum failed at all times to show tubercle bacilli.

The man has recently returned from California and I have gone over the case very fully and very frankly with him and have advised him to have an operation for the purpose of definitely curing the abscess and getting rid of the continued discharge. I have a number of abscess of the lung cases now that

have worn tubes for a great many months or years and these patients are able to keep in very fair general condition as long as they maintain good drainage It is often a very serious and difficult problem to determine what to do with these old chronic abscesses that refuse to heal We have been able to cure some of them with bismuth paste and some of them by resecting a number of ribs over the abscess and allowing the chest wall to collapse I have not had very much experience with lobectomy or partial lobectomy, so often advised and carried out by a number of surgeons I have regarded the operation for resection of a portion of the lung as one that carries with it a grave risk and one that was uncertain as to its curative effect, and one, therefore to be avoided as a general proposition

I shall do this operation this morning under local anesthesia using ½ of 1 per cent apothesine and 1 100 000 adrenalin It will be a slow and rather tedious operation for you to witness, because I shall take plenty of time to the various steps and attempt to anesthetize the tissues thoroughly before they are invaded I infiltrate first the soft parts around this fistulous tract and then the chest wall pretty widely, the size of my hand, so that I can resect two three or four ribs as conditions require The extent of the operation I cannot tell you beforehand My plan however is to resect enough ribs to expose the abscess fully and enable the chest wall to collapse and obliterate the abscess and possibly to split the abscess open so that we can make a wedge-shaped cavity which we can compel to heal from the bottom as we used to do so frequently in connection with cases of necrosis of the tibia where we would chisel out a trough in the tibia, remove the dead bone, and secure complete wound healing either by epidermization from the edges of the wound or by covering the trough with skin grafts or with a pedicle flap of skin

I want to call your attention to one interesting fact in connection with this fistulous tract, that is that it is lined with perfectly healthy looking epidermis as far as I can see into the tract After infiltrating the soft tissues of the chest wall I shall block the intercostal nerves with the same solution in their

grooves on the sixth seventh, eighth and ninth ribs, opposite the angle of the ribs Now that the entire field is anesthetized, I make an oblique incision directly along the ribs from the angle of the seventh rib downward and outward, about 6 inches in length enclosing the fistulous tract (Fig 468, *a*), dissect back the skin and soft tissues down to the sixth, seventh, eighth and ninth ribs I free the seventh, eighth, and ninth ribs of their periosteum for a distance of about 4 inches and resect 3 inches of these ribs As I do this I find a rather interesting result As the chest wall becomes flaccid after removal of the rigid ribs I can push the chest wall inward and force some pus out of the fistulous opening I now split up the fistulous opening for a distance of about 3 inches and find that it leads me into an abscess about the size of a small hen's egg (Fig 468 *b*) I can mop out a little pus from this abscess cavity, and I find as I split the abscess cavity open, dividing some indurated, edematous lung tissue over it, that the abscess cavity is lined with a rather tough pyogenic membrane that looks almost like skin or tough mucous membrane I can see very distinctly at the upper end of the abscess that a good-sized bronchus about the size of a small lead pencil opens into the abscess cavity and the air can be heard whistling in and out (Fig 469 *a*)

I shall infiltrate the lung tissues around this abscess cavity, and the thought occurs to me that I may be able to dissect out the abscess entirely and although I have never done this in similar cases I believe that conditions here lend themselves very well to such a procedure, and I shall attempt it You will notice that I have not removed as yet the fistulous tract which was lined with skin. I shall use this as a tractor to draw the abscess cavity down so that I can dissect it out With a very sharp knife I dissect out this lining membrane which is about as thick as fair-sized blotting paper You will notice that the lung tissue is fairly vascular and that I have to apply a number of artery clamps in order to control the hemorrhage I am surprised at one thing here in the operation that is that I can draw down the lung tissue into the operative field so as to make the entire operation very accessible I bring it down using the

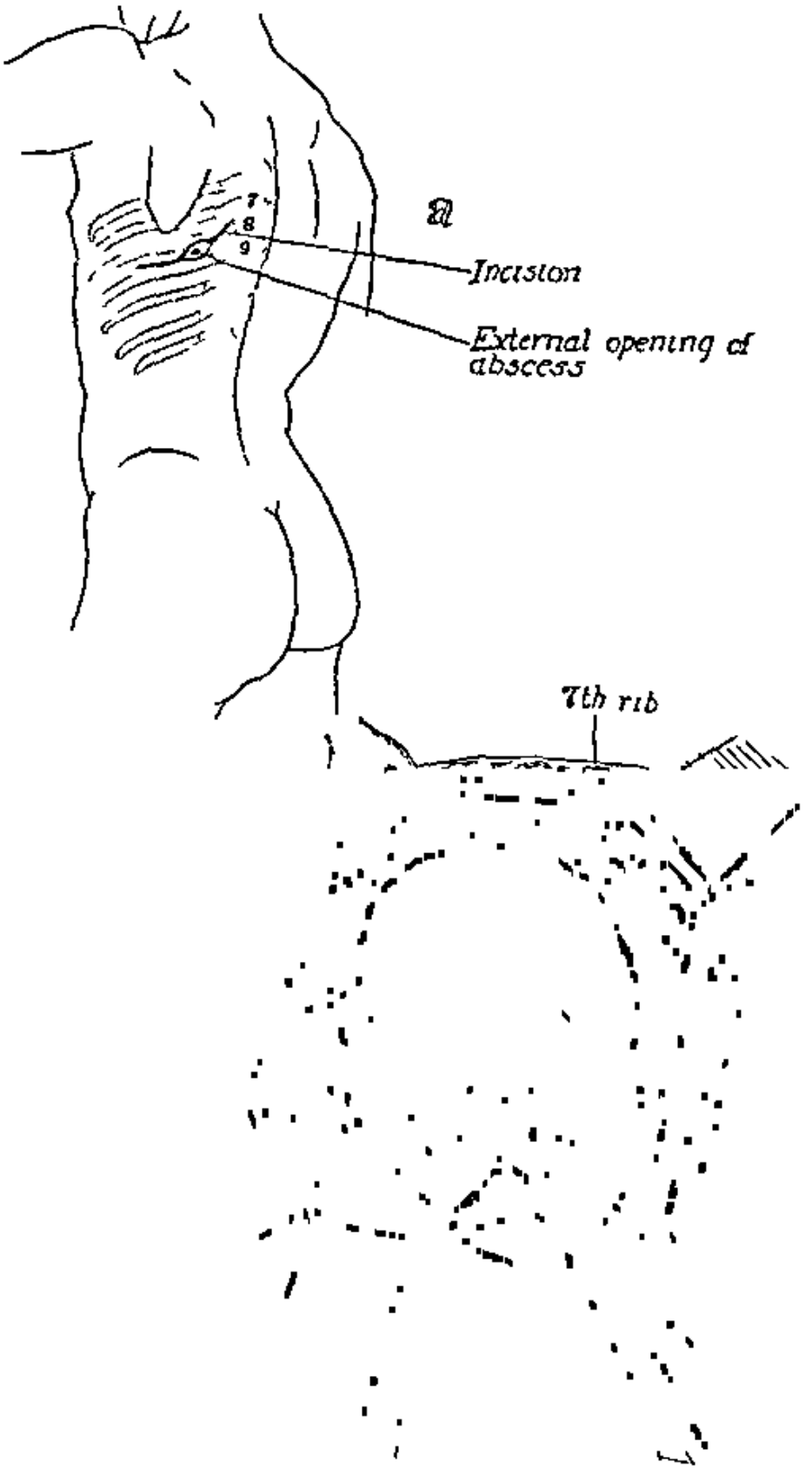

Fig 468.—a, Incision b, 3 inches of seventh, eighth and ninth ribs resected, exposing pleura Dotted line indicates extent of abscess

Fig 469.—*a*, Abscess opened, *b*, abscess wall dissected out.

fistulous tract as a tractor and also the artery forceps with which I have clamped the lung tissues on either side of the abscess (Fig 469 *b*) As I continue the dissection toward the diaphragm anteriorly I open into two smaller abscess cavities one about the size of a cherry and one about the size of a bean I have to extend my dissection outside of these and resect a small part of the lobe of the lung including this infected tissue Continuing the dissection and infiltrating ahead of the dissection with local anesthesia you will notice that I am able to dissect out the entire abscess cavity just as one would dissect a wen from the scalp The comparative ease with which we have been enabled

Fig 470—Operation completed site of abscess packed with gauze

to do this is rather a surprise to me I cannot help but feel that this method of handling lung abscess may open up a new field of work Just what to do with the open bronchus at the upper end of the abscess I am somewhat uncertain and undecided I believe however it would be of little value to attempt to sew it together with catgut sutures I think on the whole the safest plan will be to pack this cavity with iodoform gauze leaving a boat shaped cavity which I shall compel to heal by granulation and shall endeavor to cover with *epidermis either* from the edges of the incision or later by Thiersch grafts (Fig 470)

After management—I shall make no effort to close the skin

incision except that at either end I shall introduce a black silk suture to diminish somewhat the extent of the incision leaving however, about 3 or 4 inches of the incision open, which I shall pack with iodoform gauze Over this I shall place a large gauze compress

I cannot help but feel that this is one of the most interesting pieces of work that we have done in the clinic for a long time, and that it may lead to some very interesting developments I have a number of patients now with lung abscess of this chronic type, and the thought occurs to me that it might be well to undertake this same procedure in a number of cases and test it out Operations of this kind done under local anesthesia, although slow and tedious are, in my judgment, very much safer than operations done under general anesthesia Whether it will be possible in other lung abscess cases to follow the same technic that we have done so easily in this case is of course, a question, and yet I feel that certainly some of these cases can be handled in this way I am quite confident that this will lead to a permanent cure in this patient's case that we have removed entirely the damaged portion of the lung and that we will be able to obtain complete closure either by granulation and epidermization or by skin grafts or possibly with a pedicle flap

After-history —The patient experienced a good deal of pain for the first twenty four hours after operation. There was a small amount of mucopurulent discharge on the gauze which was changed at the end of forty-eight hours and changed again at the end of seventy two hours There was a fairly sharp rise in temperature up to 102° F the second and third days. This came down to normal on the fourth day The wound under the iodoform gauze dressing was kept in very good condition and was granulating rapidly

x RAY DIAGNOSIS OF GALL-STONES

Summary Two pat ents with vague abdom nal symptoms showing definite shadows in the *x* ray compatible with be ng the shadows of gall stones pathology at operat on *x* ray of l ttle value in the diagnos s of chole l thiasis

THIS morning I shall have the opportunity of showing you two very interesting gall bladder cases at least two cases in which the diagnosis of gall bladder disease has been made from evidence which we have obtained I am personally very much interested in them because they represent an exception to the rule as to the value of the *x* ray evidence which we have for years accepted in this clinic

Both patients are women with rather vague indefinite abdominal distress and without the clinical picture of gall stone colic attacks Both of them show definite shadows in the region of the gall bladder consistent with being the shadows produced by gall stones Shortly after the *x* ray was introduced into medical work and after I had employed it in the diagnosis of stone in the kidney I experimented with it in gall stone cases and found that it was very difficult to show even a large gall stone with the *x* ray in the great majority of cases In order to test the matter out I did a series of experiments the most important being taking a beef s liver and making a long incision in it putting in this incision a dozen different gall stones taken from a dozen different patients closing the incision with sutures and then taking an *x* ray picture of the beef s liver to determine whether the gall stones would throw definite shadows I found that the ordinary gall stone composed largely of cholesterol would not throw any more of a shadow than the liver tissue itself A few bigger gall stones one a large stone which I removed from the cystic duct and the other a large single mulberry stone which I removed from the gall bladder threw quite definite shadows These were heavier than the ordinary cholesterol stone and contained on analysis a good deal of car

bonate of calcium Repeated experiments of this kind convinced me that the great majority of gall-stones would not throw a shadow when exposed to the *x*-ray This was in keeping with the attempts that we had made to obtain *x* ray pictures of gall-stones in patients It is, of course, difficult to give definite figures and percentages as to what percentage of gall-stones will show in the *x* ray and what will not, but I think it is safe to say that less than 10 per cent. of gall-stones will throw definite shadows which can be made out in *x* ray examination There has, of course, been a good deal of improvement made in *x* ray technic in the last twenty years, and I think it is fair to say that a larger percentage of stones can now be shown than formerly, but I think the rule would hold good at least it has in our own clinic, that the *x* ray furnishes us definite positive evidence of the existence of gall-stones in less than 10 per cent. of all gall stone cases. I mean, of course, by definite evidence, shadows of stones. When it comes to suggestive evidence of gall-stone disease, such as a high lying duodenum, or evidence that is interpreted as meaning adhesions about the gall-bladder, I want to say very *emphatically that I place no confidence in evidence of* this kind In our clinic, therefore, we make the diagnosis of gall-stone disease practically independent of *x* ray evidence. We very frequently have these patients examined with the *x*-ray, as we have had in these two cases and if there is a definite positive shadow we accept it for its face value as a piece of definite evidence. If, on the other hand there is no shadow, we do not place any confidence whatever on the negative evidence obtained It is, therefore, singular that we should have in this clinic on the same morning two patients with the clinical diagnosis of gall stone disease and in both cases definite shadows consistent with being gall-stones.

The first patient is a Jewess thirty years old She consulted me about a year ago for abdominal distress which at that time we regarded as probably chronic colitis and I advised her against having an operation placing her upon medical management. She *improved* somewhat but came back to us about a week ago complaining of tenderness over the gall bladder rather

marked constipation no definite history of gall stone attacks, but with enough gall bladder tenderness to make one think seriously of a gall bladder infection x Ray examination shows quite definitely a dozen small shadows about the size of good sized currants apparently in the gall bladder There has been no evidence of obstruction in the cystic duct with resultant enlargement of the gall bladder There has been no jaundice

On analyzing the facts I have conserted to operate on her I must confess that the definite shadows of gall stones furnish us a piece of evidence which makes me more willing than I otherwise would be to operate on this particular case, because the abdominal distress and abdominal symptoms generally are not sufficiently typical of gall stones to warrant my making a definite clinical diagnosis unless we have the additional evidence furnished by the x rav

The patient is now anesthetized and we shall make our usual S shaped incision Let me again call your attention to the fact that we leave two thirds of the rectus muscle to the outer side of this incision so as to avoid any paralysis of at least two thirds of the muscle fibers

Opening the peritoneal cavity I find a rather normal looking gall bladder a little flaccid as though it had at one time been more distended than it is now and had partly emptied itself On palpating it I can feel a dozen or more moderate sized gall stones in its caliber and one which seems to be crowded pretty well into the neck of the gall bladder There are no stones in the common duct Examination of the duodenum, pylorus and pyloric end of the stomach shows nothing abnormal Standing on the right side of the patient I free the fundus of the gall bladder from the liver so that I can separate at least two thirds of the gall bladder from the fundus down toward the cystic duct from the groove in the liver You will notice that I now change my position and step to the left side of the patient I want to again emphasize the importance of this piece of surgical technic because this maneuver makes it much easier to remove the gall bladder safely and to clamp the cystic duct without taking any chance of injuring the common or hepatic ducts than would

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they do not but the leakage is sufficiently frequent to make me believe that it is wiser to drain I take it for granted that in gall stone cases we are dealing with as a rule a moderately infected mucous membrane of the bile tracts and that not infrequently because of that fact we have a slight local infection which is much safer dealt with by temporary drainage than by immediate and complete closure We have learned to rely upon and have found a good deal of comfort in the use of iodoform gauze in these cases I think the moderate infection of the bile tract mucosa is as a rule taken care of by the iodoform gauze and if any infection does occur we are always very thankful that we have left in the drain

Note—The patient went on to an uninterrupted and very satisfactory recovery The gall stones were put in a piece of liver tissue and *x* rayed and we are to have them examined chemically to see if we can determine why these particular gall stones caused such definite shadows

The second patient we shall operate upon this morning is a medical colleague of mine a woman who has done exceptionally outstanding work in her subject She has been under par for a number of months with rather vague abdominal distress She has had some arthritis and some skin eruptions similar to the eruptions that occur not infrequently in rheumatic infections She has consulted a number of physicians and has placed herself upon a strict diet and has looked into the question of a possible focal infection She has had her teeth examined and put in condition and tonsils removed Her general condition is at present fair She was in a sanitarium under medical management some months ago and had an expert make an *x* ray examination of the abdomen He found a shadow which he believed was a gall stone in the gall bladder She has never had any outspoken clean cut gall stone colic attacks She has however had definite tenderness over the gall bladder and some abdominal tenderness in that region nothing however sufficiently severe to be characterized as gall stone colic

She came to me a few days ago fully determined to have an operation on her gall bladder I referred her to a medical

be possible if the operator remained on the right side of the patient. In freeing the lower part of the gall-bladder or at least that portion of the gall bladder leading to the cystic duct, I clamp the cystic artery and some connective tissue which binds the gall bladder pretty firmly to the liver at a point about 1 inch posterior to the cystic duct proper divide the cystic artery and this connective tissue with the scissors. This enables me with the blunt closed end of a pair of artery forceps to separate the neck of the gall-bladder from the liver and to expose the cystic duct and isolate it from any surrounding tissues. You see we now have the gall-bladder suspended from the cystic duct like a pear with its stem I clamp the cystic duct with a pair of full curved forceps made for that particular purpose and palpate quite carefully the proximal end of the cystic duct to be sure I am leaving no stones. I place another pair of curved forceps just proximal to the first pair and divide the cystic duct with curved scissors. In this case I ligate both the cystic artery and cystic duct with the same ligature of moderate sized catgut. I do this because the entire pedicle composed of cystic artery and duct is rather small and we can handle it very easily in this way These full curved forceps made for this special purpose are of particular value because they enable me to slip the catgut proximal to the forceps and be sure that when the catgut is tied the forceps are not included

I now remove the forceps and shall introduce a split rubber drain containing a wick of iodoform gauze This is carried down to the stump of the cystic duct and left in contact with the rough surface of the liver from which the gall-bladder has been dissected The incision is closed in the usual way with catgut through the peritoneum silkworm gut sutures through the rest of the layers placing them about $\frac{3}{4}$ inch apart medium sized catgut in the anterior sheath of the rectus, and silk in the skin

Some doctors who have visited our clinic have sometimes asked the question why we drain these cases and why we do not make a complete closure as has been advocated by some surgeons. Our experience is that a certain number of these cases leak bile for a few days, sometimes for a week or two As a rule

they do not, but the leakage is sufficiently frequent to make me believe that it is wiser to drain I take it for granted that in gall stone cases we are dealing with, as a rule, a moderately infected mucous membrane of the bile tracts, and that not infrequently because of that fact we have a slight local infection which is much safer dealt with by temporary drainage than by immediate and complete closure We have learned to rely upon and have found a good deal of comfort in the use of iodoform gauze in these cases I think the moderate infection of the bile tract mucosa is as a rule taken care of by the iodoform gauze, and if any infection does occur we are always very thankful that we have left in the drain

Note—The patient went on to an uninterrupted and very satisfactory recovery The gall stones were put in a piece of liver tissue and *x* rayed and we are to have them examined chemically to see if we can determine why these particular gall stones caused such definite shadows

The second patient we shall operate upon this morning is a medical colleague of mine a woman who has done exceptionally outstanding work in her subject She has been under par for a number of months with rather vague abdominal distress She has had some arthritis and some skin eruptions similar to the eruptions that occur not infrequently in rheumatic infections She has consulted a number of physicians and has placed herself upon a strict diet and has looked into the question of a possible focal infection She has had her teeth examined and put in condition and tonsils removed Her general condition is at present fair She was in a sanitarium under medical management some months ago and had an expert make an *x* ray examination of the abdomen He found a shadow which he believed was a gall stone in the gall bladder She has never had any outspoken clean cut gall stone colic attacks She has however had definite tenderness over the gall bladder and some abdominal tenderness in that region nothing however sufficiently severe to be characterized as gall stone colic

She came to me a few days ago fully determined to have an operation on her gall bladder I referred her to a medical

be possible if the operator remained on the right side of the patient In freeing the lower part of the gall bladder, or at least that portion of the gall bladder leading to the cystic duct, I clamp the cystic artery and some connective tissue which binds the gall bladder pretty firmly to the liver at a point about 1 inch posterior to the cystic duct proper, divide the cystic artery and this connective tissue with the scissors This enables me with the blunt closed end of a pair of artery forceps to separate the neck of the gall bladder from the liver and to expose the cystic duct and isolate it from any surrounding tissues You see we now have the gall bladder suspended from the cystic duct like a pear with its stem I clamp the cystic duct with a pair of full curved forceps made for that particular purpose and palpate quite carefully the proximal end of the cystic duct to be sure I am leaving no stones I place another pair of curved forceps just proximal to the first pair and divide the cystic duct with curved scissors In this case I ligate both the cystic artery and cystic duct with the same ligature of moderate sized catgut I do this because the entire pedicle composed of cystic artery and duct is rather small and we can handle it very easily in this way These full curved forceps made for this special purpose are of particular value because they enable me to slip the catgut proximal to the forceps and be sure that when the catgut is tied the forceps are not included

I now remove the forceps and shall introduce a split rubber drain containing a wick of iodoform gauze This is carried down to the stump of the cystic duct and left in contact with the rough surface of the liver from which the gall bladder has been dissected The incision is closed in the usual way with catgut through the peritoneum silkworm gut sutures through the rest of the layers placing them about ¾ inch apart medium sized catgut in the anterior sheath of the rectus, and silk in the skin

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a rather normal looking gall-bladder, but on picking it up between the thumb and finger of my right hand I find a large nodular, single stone in the neck of the gall-bladder. I shall remove it just as I did in the previous case, standing first on the right side of the patient until I have freed the fundus and posterior two-thirds of the gall-bladder freely from the liver, then stepping to the left side of the patient and completing the more difficult dissection of separating and isolating the cystic duct. This is done, as you notice, with little difficulty I clamp the cystic artery separately, clamp the cystic duct, and remove the gall-bladder and posterior portion of the cystic duct. I find no evidence of any lesion of the common duct, pancreas, duodenum, pylorus, or pyloric end of the stomach We close the incision in exactly the same way as in the previous case, leaving in a split drainage-tube containing an iodoform wick.

On opening the gall-bladder removed you see that it contains a single, very peculiar looking stone covered with small round projections, looking like an encapsulated mulberry calculus. The stone feels very heavy in one's hand, very much heavier than an ordinary gall-stone, and I have no doubt that we will find it contains a good deal of carbonate of calcium, and that is why it gives such a definite shadow We shall use this calculus in the same experiments that I said we would make with the calculi removed from the first patient, and we shall also have it carefully examined.

Before closing this morning I want, in connection with these cases, to refer to a case which we operated on several years ago in this clinic in which we believed that we had very definite evidence of stone in the common duct. A minister was brought to the service with profound jaundice, due, as we believed, to common duct obstruction. The x-ray picture showed a small, rather round or oval calculus about ½ inch in diameter apparently in the common duct. I operated upon that patient and found a calculus of about the same size and approximately the same shape as the shadow which we had on the x-ray plate. He went on to a very satisfactory recovery. I was astonished, however, when I examined this stone to find how light it was in the hand,

a rather normal looking gall bladder, but on picking it up between the thumb and finger of my right hand I find a large nodular, single stone in the neck of the gall bladder I shall remove it just as I did in the previous case, standing first on the right side of the patient until I have freed the fundus and posterior two-thirds of the gall bladder freely from the liver, then stepping to the left side of the patient and completing the more difficult dissection of separating and isolating the cystic duct This is done, as you notice, with little difficulty I clamp the cystic artery separately clamp the cystic duct, and remove the gall bladder and posterior portion of the cystic duct I find no evidence of any lesion of the common duct, pancreas, duodenum, pylorus, or pyloric end of the stomach We close the incision in exactly the same way as in the previous case, leaving in a split drainage tube containing an iodoform wick

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and I wondered why it had thrown such a definite shadow In experimenting with it I found that we could not obtain a shadow of the stone in a piece of liver tissue I therefore took a picture of the patient after he had recovered and very much to our surprise we found that he still had exactly the same shadow that we had found before operation It proved that the stone which we had removed although it was apparently the same size was in no way responsible for the shadow found on the *x* ray We came to the conclusion that that shadow was either a silent calculus in the kidney or a shadow due to some calcareous deposit in a lymph gland

I mention this case because in this second case which we have just operated upon the shadow shown in the *x* ray is apparently in the liver tissue itself After this patient recovers we shall take another *x* ray picture and see if she still has this same shadow In the light of the experience which we have just referred to I shall not be greatly surprised if it were shown that she still had the shadow which we have found on this plate and in her case of course it will have to be interpreted as probably a calcareous deposit in a lymph gland

There is just one other point which I would like to mention in connection with the *x* ray in these cases that is the inflation of the peritoneal cavity with oxygen gas before taking *x* ray pictures This method was demonstrated at the last meeting of the American Medical Association at Atlantic City and some of the results obtained were certainly very definite and we were all impressed with the fact that this might increase very greatly the usefulness of the *x* ray as a means of diagnosis in abdominal lesions

FIBROMA OF LARGE INTESTINE

Summary A patient presenting a left sided abdominal tumor, melena, and increasing evidence of intestinal obstruction, diagnosis discovery at operation of submucous fibroma of splenic flexure heading intussusceptum into descending colon and sigmoid advantages of muscle splitting incision

THIS is a case of Dr B W Sippy s, in which, even after a most exhaustive study, a definite clinical diagnosis cannot be made

The patient is a man of thirty four who has had for a year or more hemorrhage from the bowel and, from the evidence obtained, quite certainly from the large intestine At one time a diagnosis of ulcerative hemorrhagic colitis was made and the patient put upon medical management, on which he improved a good deal Recently, however, symptoms have become worse, and a new feature has presented itself in the case, in that a large definite tumor mass has been recently discovered in the left lower quadrant of the abdomen There has been no evidence of tuberculosis either in the lungs or in the intestine, although the possibility of tuberculosis must be considered His age makes carcinoma improbable, although it does not eliminate that possibility The definite and greatest pieces of evidence that we now have are that the patient is thirty five years of age, that he has had bleeding from the bowel for more than a year, that the hemorrhage is evidently from the large intestine There has been no associated fever suggestive of tuberculosis, and now within the last few weeks there has developed a large, definitely palpable mass in the left lower quadrant of the abdomen associated with evidences of partial obstruction of the large intestine I am quite frank in saying that I am unable, and Dr Sippy feels the same way, to make a definite clinical diagnosis from these facts On account of the obstructive symptoms that have disturbed him, and the presence of this tumor mass, I regard an exploratory as imperative to determine the character

of the lesion and we shall of course do whatever is necessary if we are able to find the definite pathology

I shall employ here an ether anesthetic and shall do as we usually do in these cases make a left muscle-splitting incision for the purpose of diagnosis and we shall probably do whatever operative procedures are required through this same incision. You see that I am making exactly the same sort of an incision that we use for an appendix operation except that it is upon the left side I shall make it probably half again as long as an ordinary appendix incision (Fig 472 *c*) This divides through the skin superficial fascia and external oblique I now retract the aponeurosis of the external oblique widely and split the fibers of the internal oblique and transversalis with two blunt dissecting forceps This brings me down to the peritoneum I now make an incision through the peritoneum *parallel to the fibers* of the internal oblique and transversalis Introducing both hands I now stretch this incision pretty widely so as to give me a full exposure of this field I at once come down to the large intestine apparently the sigmoid and draw this out through the incision The intestine is perfectly movable but it contains a large mass which is apparently inside the bowel and which I can see shining through the distended intestine. It feels to me as though we had a mass about the size of an egg or a little larger inside the intestine at this point. From its color it looks as though it might be some foreign body like a hair ball. It is also fairly movable inside the caliber of the intestine I am unable to make a definite diagnosis even now that we have this loop of intestine in our fingers I shall open the bowel and as you see I first clamp the intestine off with two pairs of intestinal forceps protected with rubber tubing so as to prevent any escape of fecal material and also to control the bleeding Walling off the intestine with two pads I make an incision through the longitudinal band of fibers in the large intestine over this mass. This incision you will notice is about 2 inches in length As

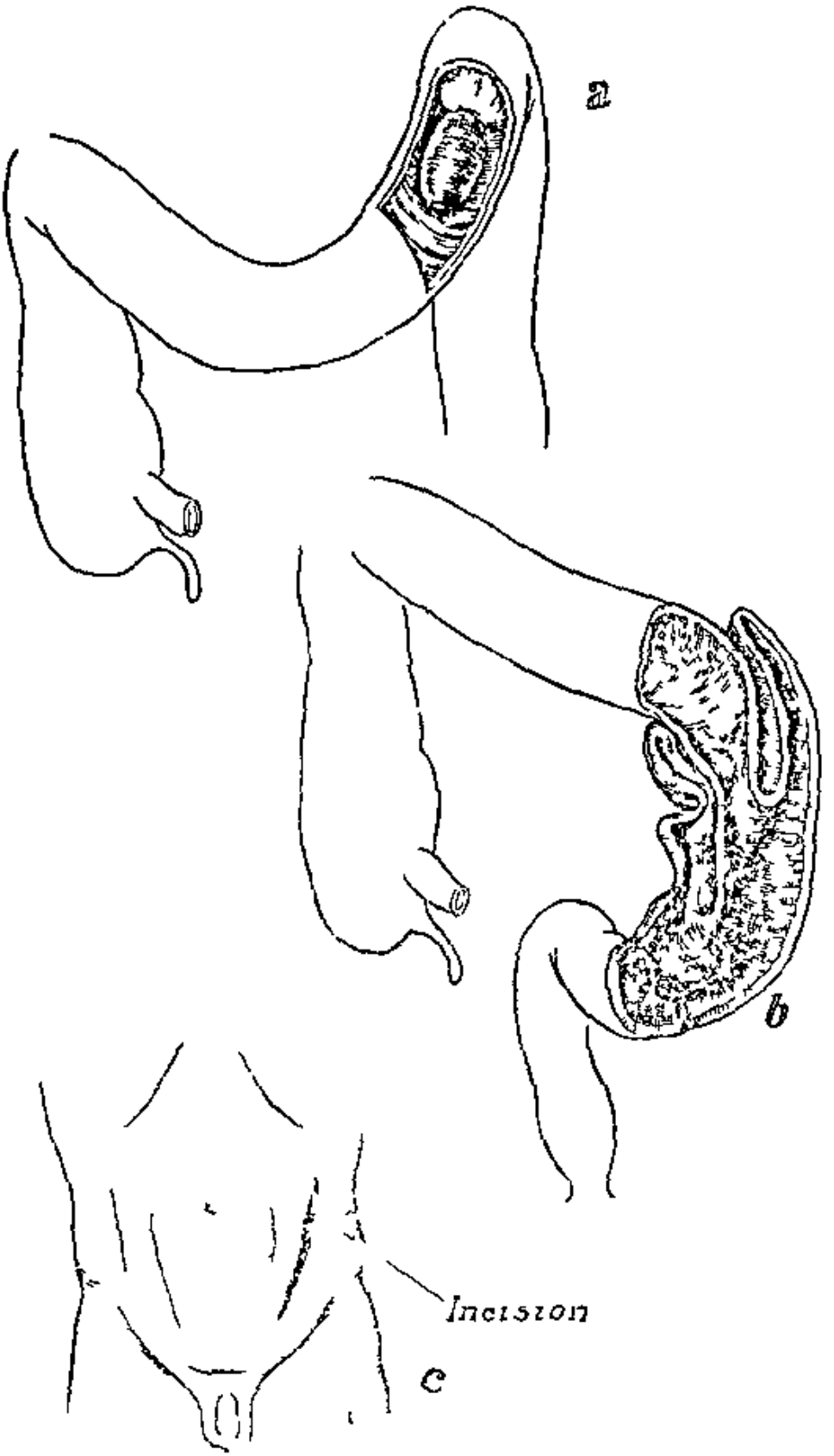

Fig 472.—*a*, Original site of tumor *b*, invagination of intestine intussusceptum headed by tumor, *c*, incision for exploration of left lower quadrant of abdomen

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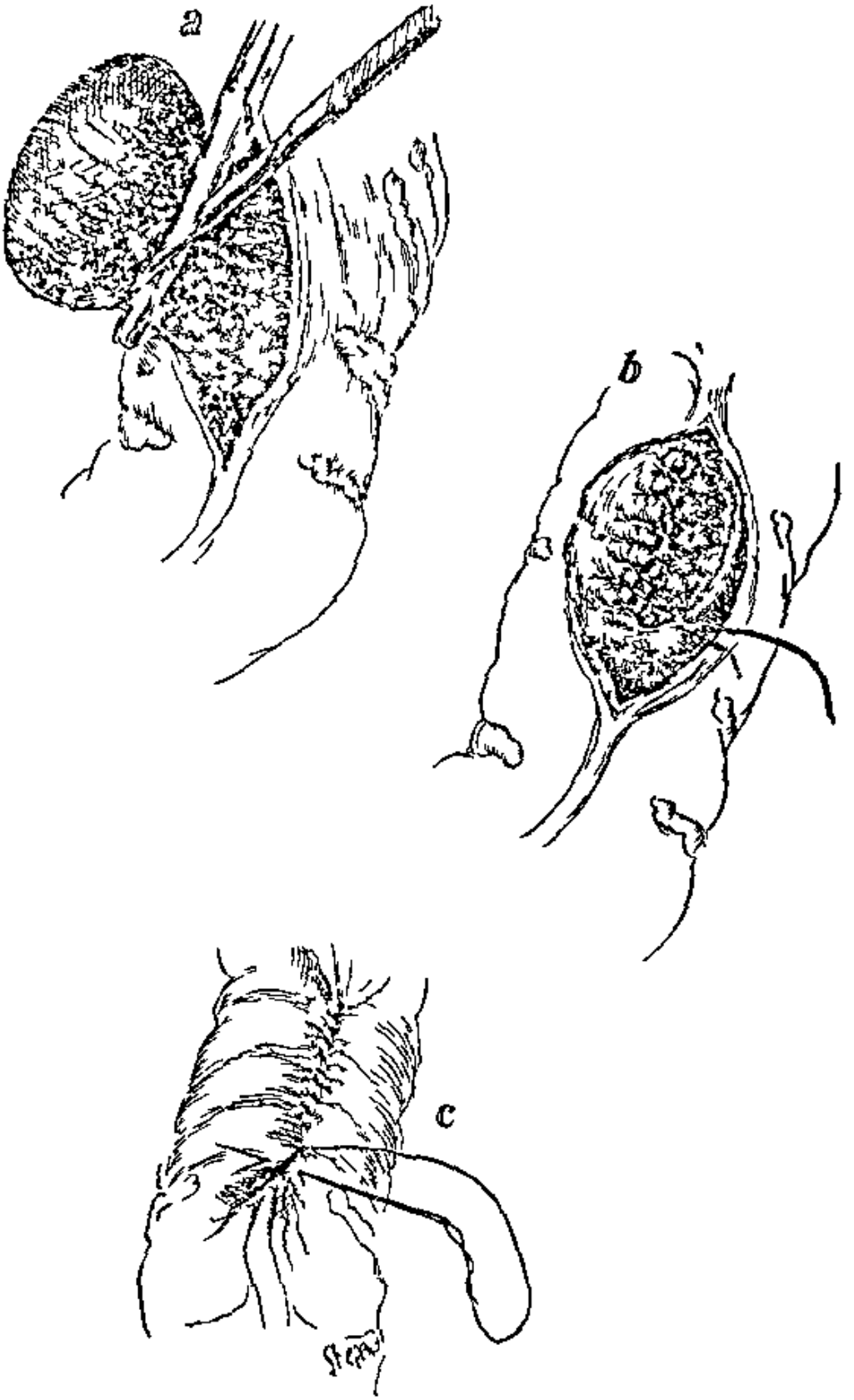
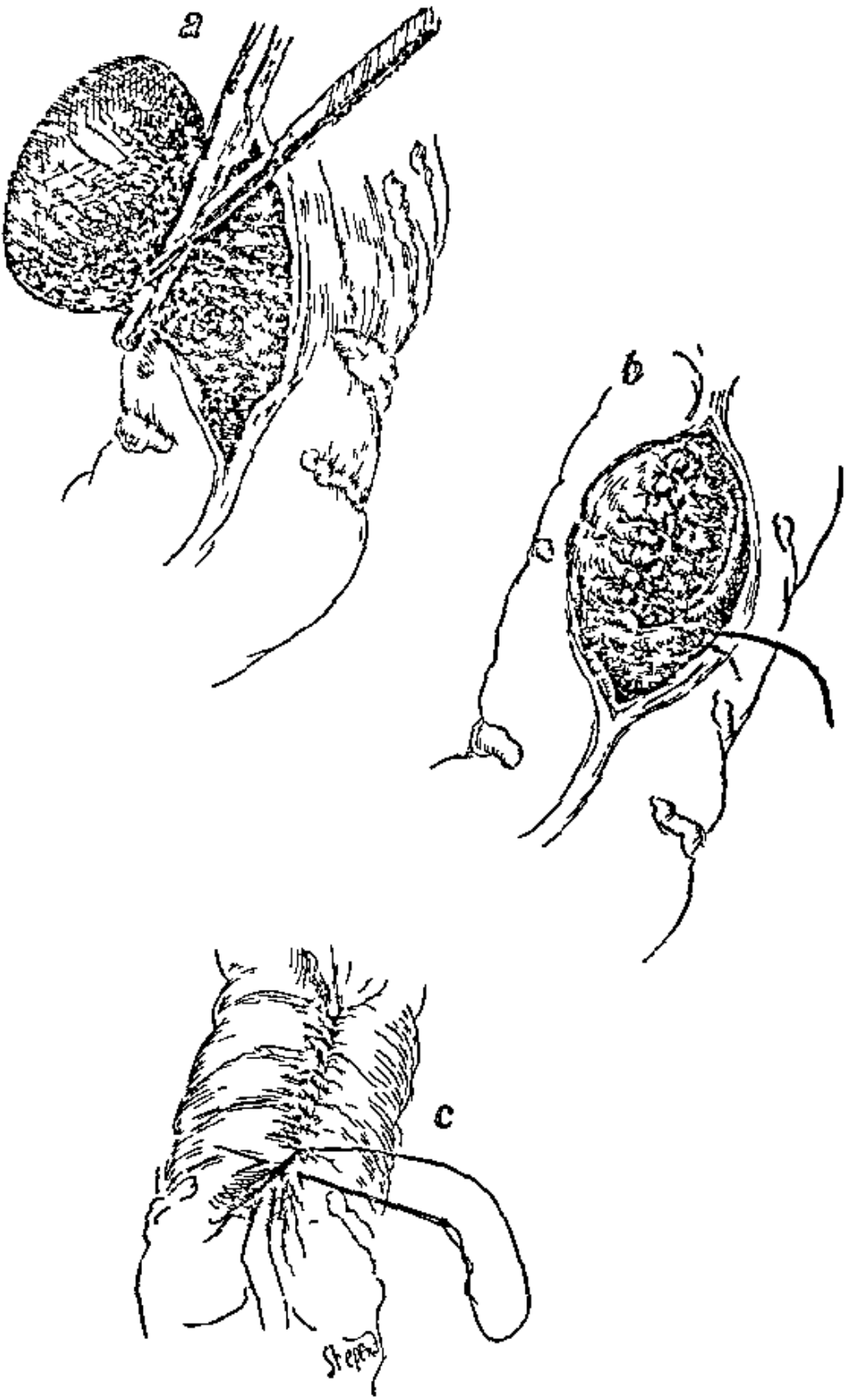


Fig 473.—*a* Excision of tumor *b* mucous membrane sutured over site of tumor *c* Lembert suture completing closure of incision in intestinal wall

testine I find it is attached to the mucosa of the intestine Examining it more carefully I find that it is a tumor about the size of a large egg springing from the inner surface of the intestine. The mucous membrane covering the tumor is necrotic and black.

I shall attempt to dissect the tumor from the bowel wall. Dividing the mucous membrane at the base of the tumor I find I can dissect the tumor out rather readily as one can a myoma from the uterus There is a definite capsule to the tumor and a definite line of cleavage which I can follow I have now removed the tumor (Fig 473 *a*) I split it open and find that it is evidently a fibroid tumor which has become gangrenous from a cutting off of its blood-supply I now carefully sew up the mucous membrane of the intestine at the point from which I have dissected the tumor doing this with a continuous suture and controlling the hemorrhage completely (Fig 473 *b*) Now with three rows of sutures I close the wound in the intestinal wall which I made to expose the tumor You notice I do this with a great deal of care so as to control the bleeding perfectly and to obtain a very accurate closure so as to prevent any possibility of leakage using this suture through the mucosa and then a second through the muscularis and peritoneum and finally a very accurately applied Lembert suture (Fig 473 *c*) Cleaning out with a moist pad around the suture line I now remove the pads and it is evident that I have to deal with a very extensive invagination of the large intestine I shall attempt to disinvaginate the intestine and after I have accomplished this I shall examine the bowel carefully to see whether it will be necessary to resect the intestine on account of gangrene at any point I shall handle the intestine with the greatest possible care in this disinvagination I am doing this very slowly as you see in the gentlest possible way and it takes eight or ten minutes for me to disinvaginate the bowel. You will notice that the amount of bowel that was invaginated was surprisingly large certainly 15 or 18 inches Now that I have succeeded in disinvaginating it completely you will see that the point of origin of the tumor must have been about the splenic flexure of the colon (Fig 472 *a b*) That is evident



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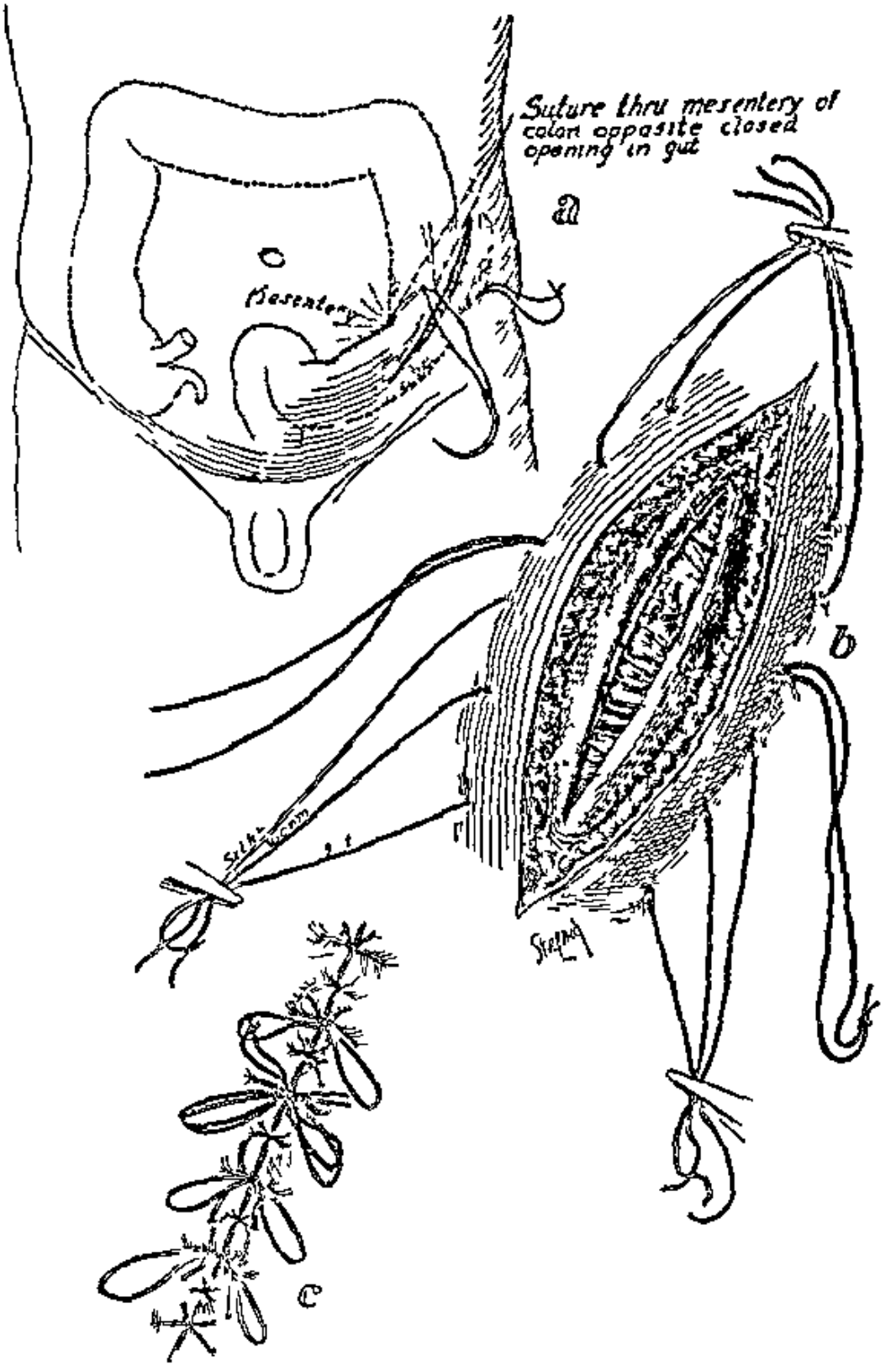

Fig 474 —*a*, Heavy silk suture passing through all layers of abdominal wall and mesocolon anchors suspicious portion of colon to region of incision, *b*, gridiron effect of the muscle splitting incision the incision in the internal *oblique and transversalis (seen in depths of wound completely sutured) lies* at right angles to that through overlying tissues *c*, closure completed Tension sutures tied with bow knots to facilitate reopening of wound if that becomes desirable

because we can see that the left edge of the omentum is just about at the point where the tumor was situated There is no evidence of gangrene of the intestine and I do not think it will be necessary to resect it I shall, however, for safety anchor this portion of the bowel to the external incision and leave some drainage down to this point, so that in the event that any leakage does occur from gangrene of the bowel, we shall have it under very good control (Fig 474)

The rest of the muscle-splitting incision is closed in the usual way I want to call your attention to the great movability of this entire section of the large intestine, that I can bring the splenic flexure down and out through this incision in the left lower quadrant without any difficulty Of course this movability is the result of the changes that have occurred gradually, and it is evident that this invagination is a chronic affair and has been going on for a long time, for it is only recently that his condition has become so aggravated as to produce partial obstruction and give rise to the picture of a definite tumor It will, of course, be necessary for us to make a microscopic examination of the mass, but I should say without much hesitation from all the evidence that it is a benign tumor, presumably a fibroma springing from the submucosa We have had several similar experiences, but nothing that is absolutely identical with this case I have operated upon a number of cases where papilloma of the large intestine had produced intussusception Sometimes these are single but as a rule the cases have been those in which a large papilloma had produced intussusception but in which we found multiple papillomatous tumors Apparently in this case we have a single tumor to deal with

Note —The after history of the case was particularly interesting He had as we feared an infection of the wound evidently a colon infection with a very foul odor I immediately opened up the wound fully cleaned it out thoroughly with peroxid and dressed it with moist boric dressings Very rapidly

CLINIC OF DR DANIEL A ORTH

St Mary's Hospital

MANAGEMENT OF NEGLECTED CARCINOMA OF THE BREAST

Summary A patient presenting a large ulcerating carcinoma of the breast with extensive regional glandular involvement and marked edema, with pain of the arm and hand on the affected side technic of preliminary Roentgen ray and radium treatment—results radical operation with the cautery knife protection of axillary structures from contracting scar postoperative dressings

This patient is a woman fifty four years of age, admitted to the hospital July 19, 1918, suffering from an inoperable cancer of the right breast

Family History —Negative—no cancer on either side

Menstrual History —Puberty at fifteen years of age Never had any disturbances of the sexual organs Climacteric at fifty Four para—two full term, two miscarriages

Habits —Good, appetite poor, bowels regular

Present Complaint —One year ago she noticed a lump about the size of a small hickory nut in the upper portion of her right breast This gradually became larger The mass was painless until it began to ulcerate about six weeks ago About this time she noticed a swelling in the axilla which rapidly grew larger Four weeks ago her arm began to swell and pain, causing sleepless nights She has been taking anodyne tablets to relieve the pain She has lost considerable weight during the last month and has noticed rapid graying and loss of hair

Physical Examination —The patient is a little old woman of waxy color who looks acutely ill Both pupils are contracted Her pulse is slow and full the left being greater than the right The artery walls are not palpable Heart and lungs are negative

about fifteen or eighteen days almost as rapidly as though no infection had occurred During this period of the colon infection the man s general condition was very good The temperature at first went up to 102° or 103° F , but came down to normal in a day or two after the wound was opened up and irrigated He had no evidences of peritonitis and no evidence of paralytic ileus or mechanical obstruction to the intestine He went on to a most satisfactory recovery without any tendency to hernia I want to emphasize this last point because it demonstrates very clearly the value of the muscle-splitting incision in this case With the muscle splitting incision even though a sharp acute infection occurred there was no difficulty in preventing any hernia or any protrusion of the abdominal contents.

Microscopic examination of the specimen showed that it was a simple fibroma

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Fig 475

In the upper quadrant of the right breast there is a large, necrotic, ulcerating mass (Fig 475, 1) The ulcer is elliptic, measuring 4 x 5 inches The edges are irregular and somewhat raised, and the surface of the ulcer is covered with a grayish, necrotic, granular mass The breast is firmly fixed to the chest wall and is edematous and hard throughout There is induration of the pectoralis major muscle and an invasion of the infraclavicular lymph glands The axillary glands are matted together and form a mass 3 x 4 inches in size These glands are hard and immovable The entire right upper extremity is hard and edematous

From the history of the case you can readily see that an operation was contraindicated when this patient was admitted, for the following reasons

1 Extensive ulceration and infection of the skin

2 Marked cachexia

3 Inability to remove the entire disease, both breast and nodules being fixed and immovable

The case looked so hopeless that several surgeons advised her not to have any surgical interference as this would only shorten her life She was given a prescription for some anodyne tablets to relieve the pain in the arm and produce sleep

As is our practice in all tumors of the breast, as a preliminary step to the radical operation, this patient was referred to Dr Henry Schmitz for Roentgen ray and radium treatment His wide experience has enabled him so to perfect the raying technic in these cases that recurrences are exceptional The patient received the following treatment

July 20th 100 mg of radium element were applied to the ulcer for fourteen hours and to the four fields surrounding the ulcer for a duration of six hours each, the total amount being 3800 milligram hours of radium element

July 27th seventeen Roentgen ray applications of 75 milliam-

Fig 475 —1 Appearance of breast on admiss on to hospital Note crater ulcer and numerous nodules in axilla and in the supra and infraclavicular fossæ 2 patient after massive doses of Roentgen rays and radium Line of operative incision ind cated by dotted line

pere minutes each were given, the filter being 4 mm. of aluminum, focal distance 20 cm , and spark gap 8 inches

August 6th, four Roentgen ray applications of 50 milliampere minutes each were given to the spine, three applications of 50 milliampere minutes each to the upper end of each femur and the inguinal region, and two applications of the same duration to the upper end of each humerus

August 13th, 100 mg of radium element were applied to the three areas for six hours each, making a total of 1800 milligram hours of radium element

August 20th, the same treatment was given to spine, femur, and humerus as on August 6th

August 27th, eleven Roentgen rays of 75 milliampere minutes each were applied to the posterior chest

September 5th the same treatment as on August 6th was given to spine, femur, and humerus

September 15th, 100 mg of radium element were applied to three areas for four hours each, making a total of 1200 milligram hours of radium element

October 5th the same treatment as on August 6th was given to spine, femur, and humerus

Today you see a widely different picture from the one previously described in this history (Fig 475, 2) The tumor of the breast is smaller, well localized, and freely movable, the ulcer is about one third the original size dry, and almost entirely healed The mass in the axilla is reduced about one third and is freely movable The infiltration of the surrounding breast areas and the swelling of the arm have disappeared There are no palpable glands in the infraclavicular region. The patient's health has greatly improved, she has gained 8 pounds in weight, the pain in the arm disappeared completely after the third raying and she has since been able to sleep without an anodyne

Although this patient should have had a radical operation when the tumor first made its appearance, she is still an "early" case, because she is of the "spare" type with no loose fatty tissue It was Dr John B Murphy's[1] teaching that "this spare

[1] Clinics of John B Murphy, M D , Vol III No 1 p 188

type has a tendency to the production of connective tissue for the encapsulation of the malignant cells holding them localized for a long period of time so that the chances for recurrence are comparatively slight The malignant cells in this case have not passed out of the lymphatics of the axilla and infraclavicular regions the supraclavicular region appears to be free from the disease and radiographs of the long bones the spinal column and the thorax show no metastases Furthermore the prog nosis in this case is good because she is of the cancer age (be tween thirty five and sixty) the lymphatics at this age are not so large and active as in the younger patients

When operating on patients at the stage of extensive glandu lar involvement and ulceration we prefer to use the electro cautery knife instead of the steel knife because it lessens the danger of dissemination by knife implantation The cautery immediately seals the blood and lymph vessels which carry the metastases and the heat kills the cancerous products

Dr A J Ochsner has used the cautery knife together with soldering irons in these advanced cases for a good many years One case operated sixteen years ago consulted him in this clinic a few days ago for some minor trouble stating that she had been well since operation There is no sign of recurrence

Operation —The patient was given a hypodermic of mor phin sulphate gr $\frac{1}{4}$ and atropin gr $\frac{1}{100}$ one half hour ago The morphin is given to prolong the anesthesia after cessation of the ether which is the anesthetic used the atropin to prevent inhalation pneumonia due to accumulation of mucus in the pharynx With the patient in the recumbent position the ether is slowly and gradually given to complete anesthesia This re quires twenty to thirty minutes by the drop method We now raise the head of the table as recommended by Dr A J Ochsner in his goiter operations to an angle of about 45 degrees which as he says produces anemia of the brain serving to make the anesthetic received effectual during operation We do this be cause we cannot continue with ether in the presence of the hot cautery knife on account of its combustibility Before begin ning cauterization the ether should be removed and the face

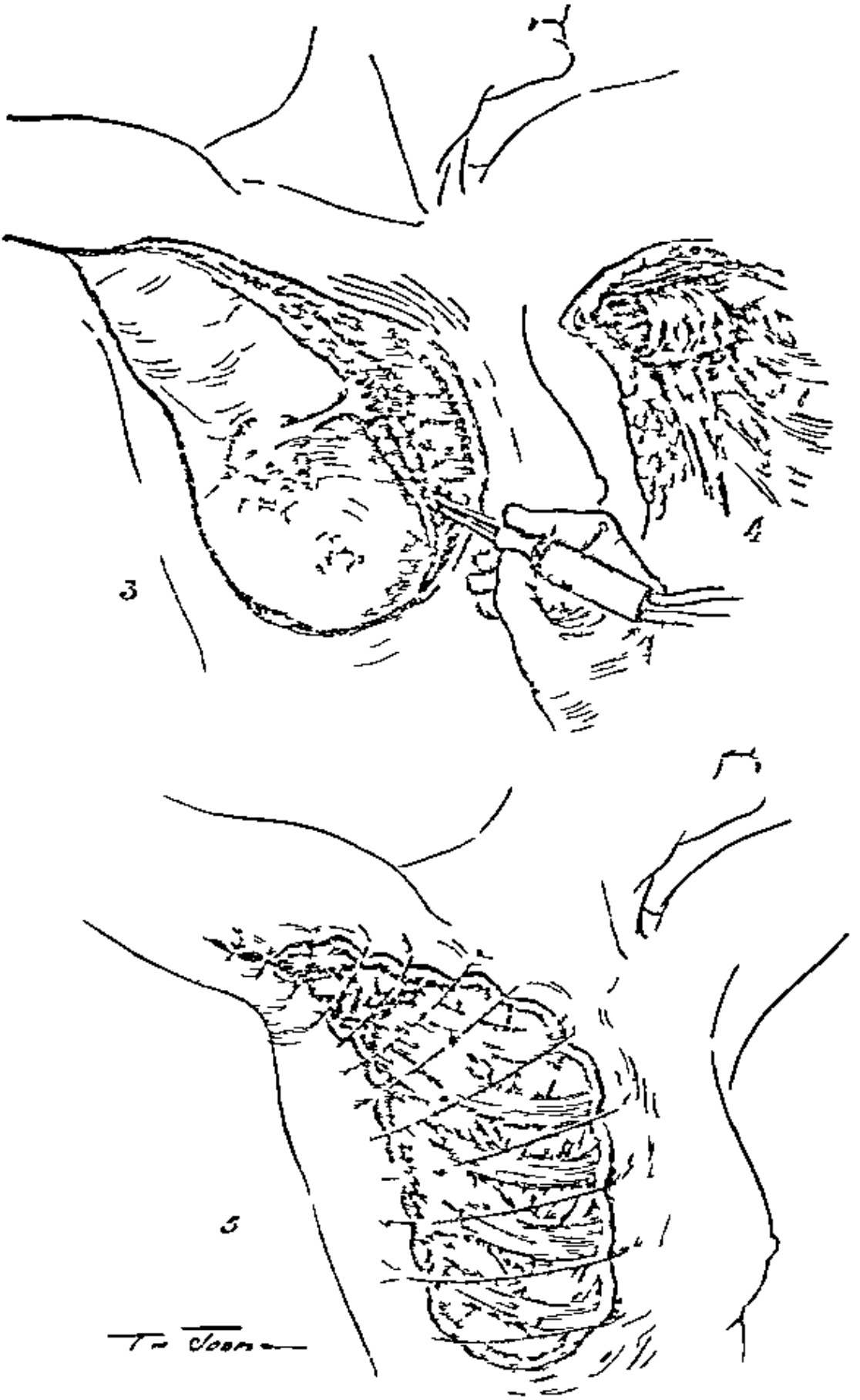

Fig 476

covered with a wet towel to prevent ignition of exhaled ether Should it become necessary to re anesthetize, lower the head and be sure to remove the cautery knife

The technic which we are using in this clinic is the following

The line of incision is marked out on the iodin coated skin by means of an applicator moistened in alcohol, this removes the iodin and leaves a line to be followed by the cautery knife We plan our incision with a view to removing all skin tissue which may possibly be carcinomatous, regardless of the possibility or impossibility of coaptation afterward There is little danger of removing too much, but there is great danger of removing too little In the cases where metastases have occurred necessitating extensive removal of the integument, no attempt should be made to close the wound by traction Either it should be allowed to close by epithelization or skin grafting should be resorted to later We should, however, use all available skin free from cancer to the best advantage in closing the axilla but in this case it is necessary to remove not only the entire skin of the axilla, but considerable skin of the arm as well This would bring the scar directly over the axillary vessels and our patient would be in the same lamentable condition she was before receiving the Roentgen rays The scar pressing on the axillary vessels and nerves would produce pain and edema of the arm To prevent this we use the pectoralis minor muscle to cover the vessels This method was introduced into this clinic fifteen years ago by Dr Nelson M Percy

The electrocautery knife is heated to a "white" heat and the integument is divided along the line of incision This is the only time during the entire operation that a 'white" heat is required, but owing to the toughness of the integument a lesser degree of heat will not divide it The lesser, or "cherry red' heat, is preferred in the deeper tissues for the reason that the "white" heat is very destructive and if used in the axilla, where the arteries and nerves are in close proximity to the disease,

Fig 476—3 Removal of cancerous tissues *en masse* with electric cautery beginning dissection at the sternum 4 stump of pectoralis minor muscle utilized to cover axillary structures 5 operation completed

there is great danger of their destruction, furthermore the "white" heat cuts the blood vessels, causing hemorrhage whereas the "cherry red" heat seals them preventing hemorrhage and metastases The heat is gauged by holding the parts that are to be removed with the free gloved hand and keeping it close to the cautery knife.

We begin the removal at the sternum in this case simply because it facilitates the dissection (Fig 476, 3) When using the electrocautery it is immaterial whether you begin at the sternum or at the axilla, hemorrhage and metastases being prevented by its use, whereas when the steel knife is used the better technic is to begin at the axilla By so doing you ligate the vessels at their trunks and thus prevent cutting and recutting them after they have divided into many branches as is the case when you begin at the sternum, causing hemorrhage and shock. We remove the entire pectoralis major muscle as well as the fascia of the upper portion of the anterior sheaths of both recti muscles care being taken not to go through the intercostal spaces with the cautery knife, thus injuring the pleura, lungs or pericardium We then separate the pectoralis minor muscle at its origin, turn it back, remove all glands, fat, and fascia from the axilla by gauze dissection, severing the vessels with the cautery knife, after which we cover the axillary vessels with the pectoralis minor muscle (Fig 476, 4) The entire breast, nodules, fat, and fascia, are now removed, together with the sheaths covering the lower portion of the serratus magnus and the upper portion of the external oblique muscle, in one piece

The skin edges are approximated at the arm without tension the remainder of the wound cannot be approximated but we continue our sutures across the entire field to prevent retraction and folding in of the flaps (Fig 476 5)

The wound is dressed with a sterile vaselin dressing which is not disturbed for forty-eight hours At the second dressing the wound is gently cleansed after which we will apply warm wet compresses of chlorazene solution 0 25 per cent These dressings are not allowed to dry so as to prevent sticking The dressings are changed daily until the wound is clean and free

from all sloughs the patient receiving at the same time post operative x ray treatments at intervals of two weeks consisting of four courses of fourteen applications each nine fields over the chest two on each side of the neck and one over the posterior axilla each field receiving 75 milliampere minutes treatment

As soon as the wound is clean the compresses of chlorazene are discontinued and hot parresine is used as follows The wound is first cleansed with chlorazene or boric acid solution then dried with an electric hot air drier after which the entire wound as well as about 1 inch of the surrounding skin is sprayed evenly with hot parresine covering the whole surface with pieces of lace mesh each piece measuring about 4 x 6 inches These pieces of lace mesh are thickly covered with hot parresine applied with a camel s-hair brush A thin layer of cotton is then applied and is in turn covered with hot parresine The whole surface is covered with gauze and held in place by a gauze roller bandage These dressings are changed every twenty four to forty eight hours depending upon the amount of serous secretion present The improvement in the condition of the wound is astonishing epithelization takes place rapidly and is not interfered with by the x ray as are skin grafts

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CLINIC OF DR EMMET A PRINTY

PROVIDENT HOSPITAL

CHOLELITHIASIS WITH CHRONIC EMPYEMA OF GALL-BLADDER: TECHNIC OF CHOLECYSTECTOMY

Summary Deta led description of technic of cholecystectomy Importance of wall ng off pouch of Morrison exposure of bile-ducts—method of isolating cystic duct and artery without endangering common duct or portal vein exploration of the ducts—an original method of determining the patency of the common duct ligation of stump of cystic duct—how to place a deep ligature

THE patient is a married woman aged fifty-one She was admitted to the hospital complaining of dull pains of varying intensity in the right hypochondriac region, which sometimes radiated to the angle of the right scapula There was some epigastric distress, with occasionally a slight feeling of nausea The patient was not constipated, had never been jaundiced, and never had had any severe attacks of pain, except at one time, two weeks ago when she had a brief attack with sharp and severe colicky pains in the right upper quadrant

Family and past histories were negative

Physical examination showed marked tenderness over upper right rectus at costal margin, and upper part of muscle was very rigid A tumor like mass could be palpated in gall bladder region Examination otherwise negative

Temperature normal, white count, 8600

A diagnosis was made of gall stones with chronic empyema of gall bladder As the pain appeared to be subsiding it was deemed wise to keep the patient at rest for a few days before undertaking radical surgical measures She has now been under observation for ten days and we feel that the time is ripe for operation

Operation —We make this incision in the right rectus muscle, about 1 to 1½ inches from the midline By making the incision

CLINIC OF DR EMMET A PRINTY

PROVIDENT HOSPITAL

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medial to the outer third of the muscle (that is, anywhere in the medial two-thirds of the muscle) we avoid injuring those intercostal nerve branches and their accompanying vessels which enter the muscle usually about the junction of the outer and middle thirds The incision extends from the costal margin to the level of the umbilicus If the patient is very fat, or more room is required we curve upward along the rib margin to the tip of the ensiform cutting the skin and fat only This enables us to retract widely the cutaneous and fat margins and aids in decreasing the depth of the wound

We have here a mass of adhesions between the ventral surface of the liver and the omentum colon and duodenum. The gall bladder cannot be seen (Fig 477) However we can soon *locate the region in which it should be Here you see a deep* cleft in the liver margin which indicates the notch for the round and falciform ligaments As we pass our finger along the liver margin to the right of this first notch we reach another depression or concavity which corresponds to the gall bladder region. We begin to free this locality from its adhesions and soon isolate the gall bladder This is done gently to avoid injuring the viscera and to avoid hemorrhage We are working now with the finger from below up as the adhesions seem to separate easier this way If you find the line of cleavage you have little trouble in the average case The tissues are thickened and edematous and the fundus of the gall bladder is covered with a shaggy brownish yellow exudate. The gall bladder is very thick walled and distended This patient has been having an acute exacerbation of a chronic disturbance and one would have expected the symptoms and findings to have been more pronounced The previous history also contains no indications of any of the disturbances we would expect from such a condition

The lymph glands here are also enlarged The head of the pancreas is also somewhat larger and harder than normal We now proceed to wall off the field of operation with sponges There is no necessity in this case of rotating the liver on its vertical axis or of depressing it However in some cases it is of

great advantage to do this maintaining the position by placing sponges above and posterior to the right lobe We are placing a pack between the right kidney and the corresponding liver surface as free fluids gravitate to this pocket—the pouch of

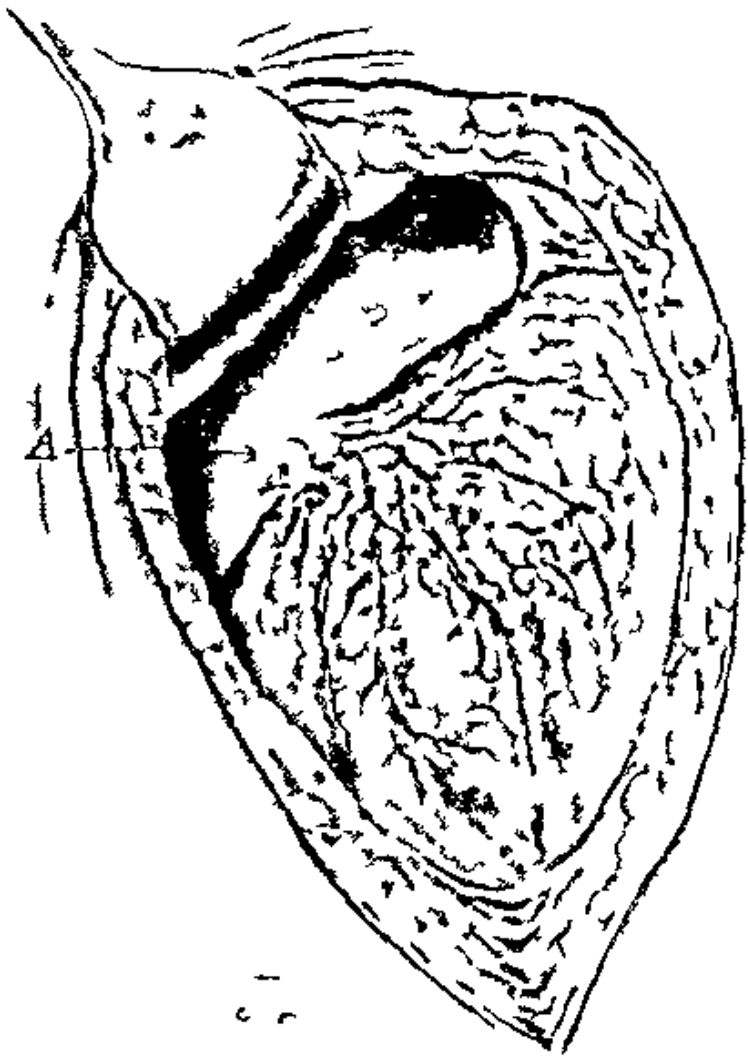

Fig 47 Mass of adhesions in gall bladder region (*A*) brought into view upon retraction of edges of abdominal incision

Morrison—when the patient is in the recumbent position we are very careful to place sponges in it before working on the gall bladder or ducts This is also a place which we must drain well in cases of ruptured gall bladder or perforated duodenal or

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This forceps which we had placed on the so called "pelvis" of the gall bladder lifts up the pouch or dependent portion of the gall bladder in this region and gives us a clearer view of the duct region (Fig 478) It also puts the cystic duct on tension and the common duct somewhat and facilitates palpation It

Fig 478 —Gall bladder freed from adhesions (note roughened peritoneal surface) and in the grasp of forceps in order to render the region of the ducts prominent The entire area has been thoroughly walled off by gauze pads

is very important to recognize clearly the duct arrangement in the individual case before placing any clamp or ligature The majority of common and hepatic duct injuries are due to failure to recognize individual variations and careless or hasty application of clamps I have for several years followed a method in

gastric ulcer and preferably through a lumbar stab wound in front of the right kidney This or another sponge can be made to close off the epiploic foramen (Winslow s) and prevent contamination of the lesser peritoneal cavity Another sponge is placed between the stomach and left lobe of the liver Other sponges keep back the intestines and colon and cover over the pylorus and upper duodenum The gall bladder and hepatico duodenal ligament (containing the ducts etc) are now surrounded by sponges which not only protect the surroundings from contamination but are a great help in isolating the field of operation when rightly placed

This gall bladder is distended with pus and stones The wall is greatly thickened and there is marked pericholecystitis The ducts and their surrounding tissues are thick and enlarged No stones can be palpated in the ducts It is possible that none have ever passed out of the gall bladder This would account for the absence of acute attacks in the present or previous history

The only thing to do with this gall bladder is to take it out If the gall bladder walls were thin and there was danger of rupture during removal we would first aspirate and remove the contents This also often facilitates the removal and allows one to get at the cystic duct better

In our cholecystectomies we endeavor when practical to remove the gall bladder from below upward This gives better hemostasis primarily and also prevents any small stones or pus from passing out of the gall bladder into the ducts during our manipulations In some cases where the neck of the gall bladder and the ducts are surrounded by dense adhesions or the ducts seem to be anomalous or the exact relationship is not clear it is better to start the removal at the fundus and work downward until we have the gall bladder detached except for the pedicle consisting of cystic duct and artery These are then clamped In other cases we sometimes find it advisable first to clamp below for the reasons given and then dissect from the fundus downward thus combining the two methods Then before cutting the pedicle we can make sure that we are within safe limits

in getting the artery and duct together in our clamps, if we are following the usual method of removal, will depend upon whether the artery meets the cystic duct early or late (Fig 480) For this reason I always make it a point to first pass the clamp relatively high, that is, around the neck of the gall bladder (Fig 480, *A*) At this point the artery should be in relatively close apposition to the gall bladder Also, the only structures we can injure at this point are the liver and the gall bladder, whereas, further down we are in danger of traumatizing or in-

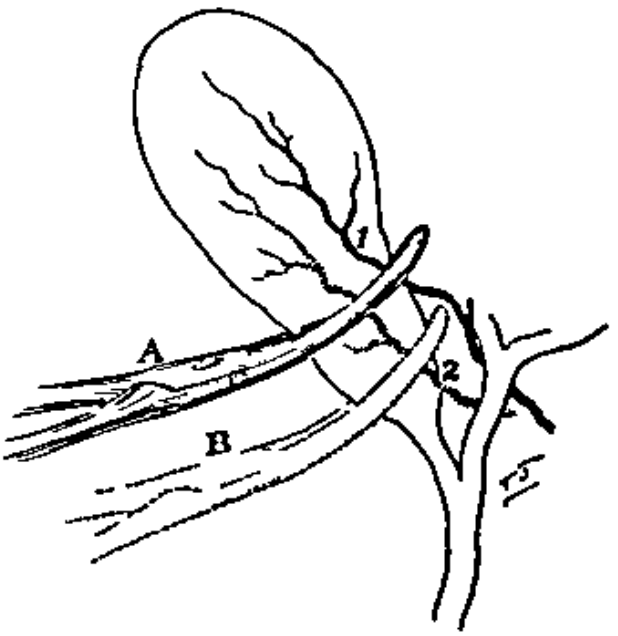

Fig 480 —*A* Forceps placed relatively high on the gall bladder will always catch the cystic artery (1) which sometimes reaches the gall bladder at a relatively high level *B* usual site for placing forceps and usual location (2) at which cystic artery reaches gall bladder

cluding in our clamp the hepatic duct common duct or the right branch of the hepatic artery, as it often passes in front of instead of behind the hepatic duct and if small it might be mistaken for the cystic artery as I have noticed in some cases I remember one case where inclusion of the right hepatic duct might have been an almost unavoidable error were it not that the ducts showed rather plainly, and the method we use was followed The left hepatic seemed to be the common hepatic, and the right hepatic and cystic were closely bound together (Fig 481) The portal vein may also be injured

placing the first clamp which I think eliminates some of the dangers of injury to other structures and which also makes *practically certain the inclusion of the cystic artery with the* duct If we call to mind the anatomy of this region we can see the reasons for this method

The cystic and common hepatic ducts usually join at an acute angle to form the common duct The former ducts are

Fig 4 9—Anatomy of the region of the cystic duct the cystic artery is represented in its usual location passing from left to right behind the hepatic duct and across the angle between the hepatic and cystic duct to the gall bladder

generally in close proximity but when the cystic duct is pulled forward and to the right the width of the angle between them is increased The cystic artery (usually from the right branch of the hepatic) runs across this angle from left to right and meeting the cystic duct or neck of the gall bladder passes up to the fundus giving off its various branches (Fig 4 9) Our success

easily slip off In some cases we may find that we have left a rather long cystic stump In that case it is an easy matter to pull up on the stump and place our ligature closer to the common duct Or, in cases where the anatomy is not sufficiently clear, or we have trouble in placing our clamps low down, we can first resect high up, and after getting the gall bladder out of the way, remove the rest of the cystic duct

If, in following this method we encounter a case where the cystic duct is closely adherent to the liver, and the surrounding tissues are very dense, we make a primary incision through these tissues on either side of and parallel with the cystic duct, and thus facilitate the placing and subsequent manipulation of the forceps In the ordinary case, however, we avoid as much as possible any unnecessary dissection or cutting until after the clamp is placed and thus avoid bleeding or hematoma formation, which might render the relationships less distinct

The remaining steps, as you see, consist of placing another clamp above the first, and cutting the duct, etc , between the two Then aided by traction, we separate the gall bladder from its liver surface, after first incising the peritoneal reflection on either side We avoid injuring the liver or opening the gall bladder by careful dissection in the line of cleavage, and by not being in too much of a hurry You notice that in some places this gall bladder is very adherent to the liver That is often the case, and usually at points where small veins from the gall-bladder are emptying directly into the liver We often find cirrhotic or even necrotic areas in the liver at these points

and
to fa

are unable to leave sufficient peritoneal flaps to suture across the denuded liver surface However, the surface is dry and fairly smooth If we feared extensive visceral adhesions to this area, we could combat them by following Andrews' method of colo-hepatopexy

We have not yet ligated the stump, because we intend to explore the ducts This is a case which certainly demands ex-

After placing the closed clamp between this portion of the gall-bladder (*i e*, the neck) and the liver, we separate the blades slightly Then we withdraw the clamp sufficiently to place one blade behind and one in front of the upper duct, and then push the clamp downward to the proximal portion of the cystic duct. Our progress is arrested when we reach the point of junction of cystic and hepatic ducts, and there is no possibility of going too far, or of any other structures except the

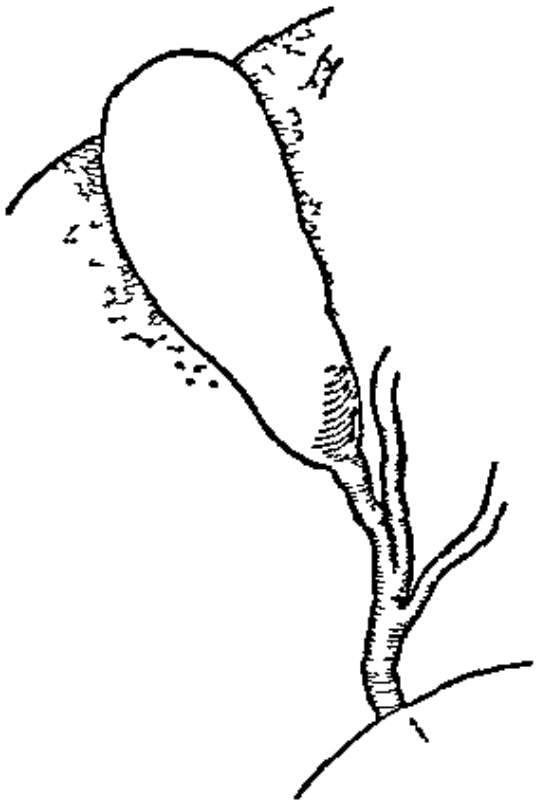

Fig 481.—Diagram of conditions found in one case in which the cystic duct and right hepatic duct were in unusually close proximity and might have been ligated together it is in such cases as this that careful, methodic technic proves its value.

duct and vessels being in our clamp We tighten the clamp then, keeping a slight distance above the termination of the duct, to avoid injuring the common or hepatic ducts with our clamp, or puckering or constricting them with our subsequent ligature. If the cystic duct were removed absolutely flush with the common duct there would naturally not be a suitable stump for ligating, and there would be some danger of puckering and interfering with the common duct Also, the ligature could

gall bladder has not been functionating and the common duct s dilated the sphincter resistance is practically nil You see

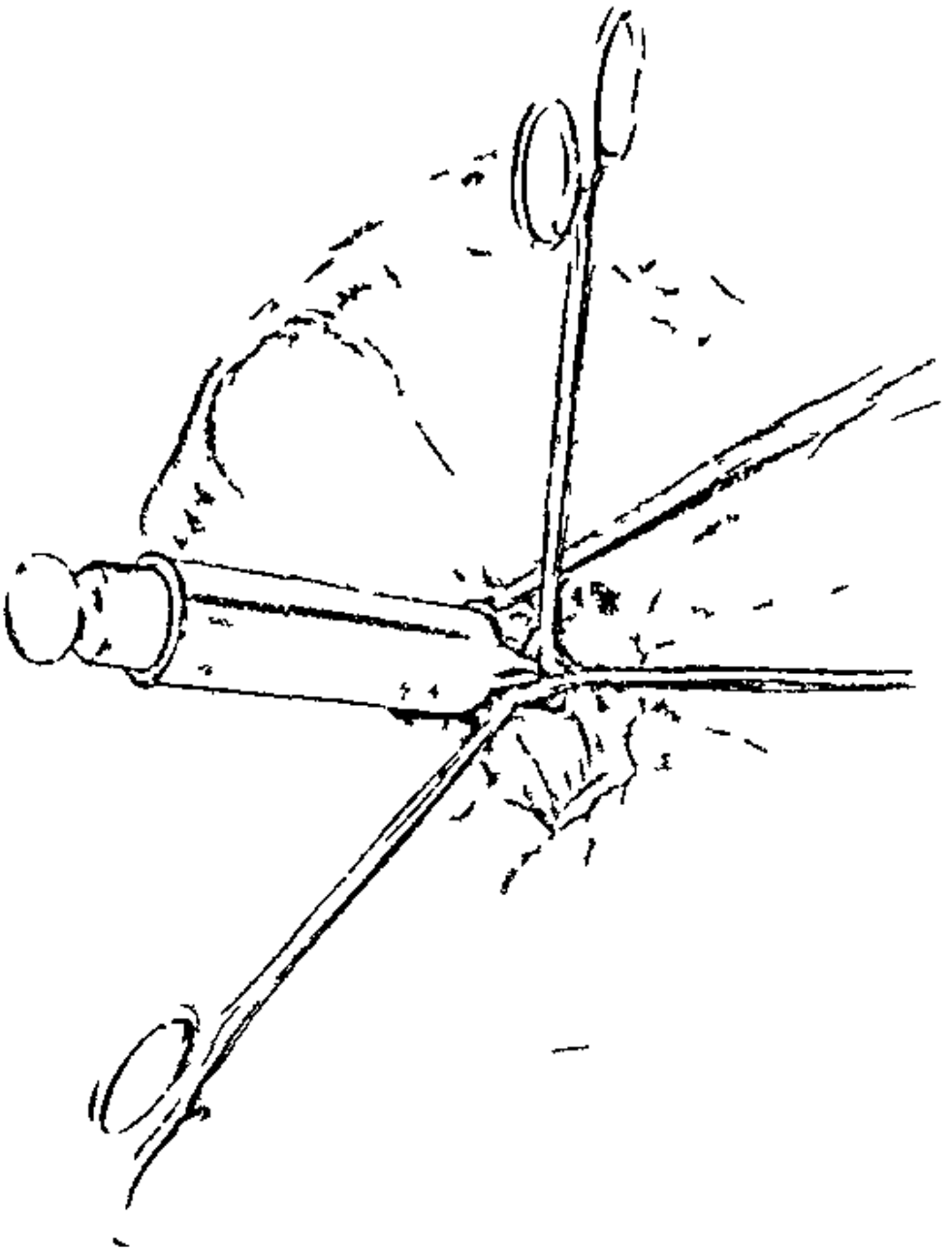

Fig 482 —Injection of liquid into common duct as a means of proving its patency and of washing out pus and fragments of calcul

that the solution used is easily passing into the duodenum with practically no pressure Therefore there is no obstruction The advantages of this procedure are that we can determine

ploration even though there have been no symptoms of common duct obstruction or any stones felt on palpation. Many times though we fail to feel stones which are actually present, and especially when they lie in the retroduodenal portion of the duct. So we will save ourselves and the patient future trouble by making sure that none are left behind. You will notice that we did not cut the cystic duct across flush with the clamp. These duct edges can now be grasped with fine forceps. We then grasp the tissues on the superior and medial aspect of the duct with another forceps as this is where the artery usually lies, *or we can ligate the artery now. Sometimes we can see its* cut end in the first clamp. Now we can remove our initial clamp with little danger of hemorrhage and we are ready to explore the duct. If the lumen is narrow or if we wish to insert a drainage-tube, we usually split the stump down to the common duct. We are introducing a probe which we bend to suit the curve. It passes up well into the hepatic duct. We meet with an obstruction in the lower portion of the common duct. This is probably due to the probe becoming engaged in a mucous fold. A method which I have used for several years consists of washing out the duct when the probe will not pass and when we wish to make sure there is no obstruction either from stone or from inflammatory swelling. We would not ligate the stump if inflammatory obstruction existed but would drain the duct. Also if one intends to close the abdominal wound without drainage after simple cholecystectomy as advocated by Willis we should make sure of the absolute patency of the duct. We now press the point of a large glass syringe into the cystic stump. Then placing a finger on the hepatic duct with sufficient pressure to prevent the saline solution from passing up to the liver we gently force the fluid into the duodenum through the common duct (Fig. 482). Very little pressure should be used merely enough to overcome the sphincter as otherwise there would be some danger of forcing some of the fluid into the pancreatic duct. If much resistance is encountered it is best not to try to force it, as we know that pancreatitis can be induced in this way experimentally. In a case of this kind where the

Fig. 483.—A convenient method for placing ligatures in regions which are difficult of access

patency, as the solution will pass through when a probe might not and also we wash out of the duct any pus stone fragments or detritus which may be present The only possible danger is the theoretic one previously mentioned In some instances as I have demonstrated anatomically, the manner of junction of the common duct and main pancreatic duct serves to establish a valve arrangement which aids in preventing the entrance of bile into the pancreatic duct There has been no trouble in the cases in which I have done this We sometimes with the syringe aspirate contents from the ducts especially the hepatic for obvious reasons

I have for some time considered the advisability of having a slender suitably curved instrument constructed to pass through the common duct into the duodenum for the purpose of dilating the orifice and stretching and if possible paralyzing the sphincter This would obviate the dilatation of the ducts with back pressure in the biliary system of the liver and possibly in the pancreatic ducts which follows a cholecystectomy and which is dependent upon the integrity of the sphincter of Oddi Also this should decrease the liability of leakage from the cystic stump when the latter has been ligated

We now ligate the stump including the artery I am placing this ligature according to a method which is a great help when placing a deep ligature as in the pelvis throat etc and in some gall bladder cases We place the ligature (No 2 chromic gut) around the forceps and tie a surgeon s knot The short end is to our right We grasp the loop lightly with a forceps and hold the long end in our left hand (Fig 483 1) The forceps now carries the loop down to and over the curved tip of the clamp on the duct We release the loop and grasp the short end with the forceps and with a sawing motion tighten this loop (Fig 483 2) The index finger of the left hand is now used to make sure that our loop is sufficiently tight We now bring the short end behind the cystic clamp from right to left and tie a complete knot while the assistant turns the clamp toward the left so as to expose this portion of the stump (Fig 484 3) This has the effect and security of a double ligature We hold the ligature

ends loosely, while we remove the cystic clamp If there should be any bleeding, or leakage of bile, our ligature acts as a guide to the stump (Fig 484, 4) You notice it is perfectly secure, so we cut off the ends of the ligature We have found this a very handy method, and it can be used in very narrow and deep wounds In the case of a large thick stump we often anchor our ligature to the stump before tying, so as to prevent the ligature slipping

This stump has been touched with phenol and alcohol and we leave it without further treatment This split tube is placed down to the duct, but not anchored to it We also place a small cigarette drain in the kidney pouch, as there was more or less seropurulent exudate encountered while freeing the adhesions

There was no indication here for common duct drainage, such as cholangitic symptoms, jaundice, etc We close the abdomen in our routine way using the preliminary mattress sutures in closing the first layer, as described in the Surgical Clinics of Chicago, Vol II, No 5, p 989, October, 1918 The drains are brought out through the upper part of the incision, but not too close to the rib margin

This patient should make an uneventful recovery, although we anticipate some drainage from the surrounding infected tissues

Postoperative Notes—The patient made an uneventful recovery Drainage was primarily rather free, but decreased daily Drain was removed on the tenth day

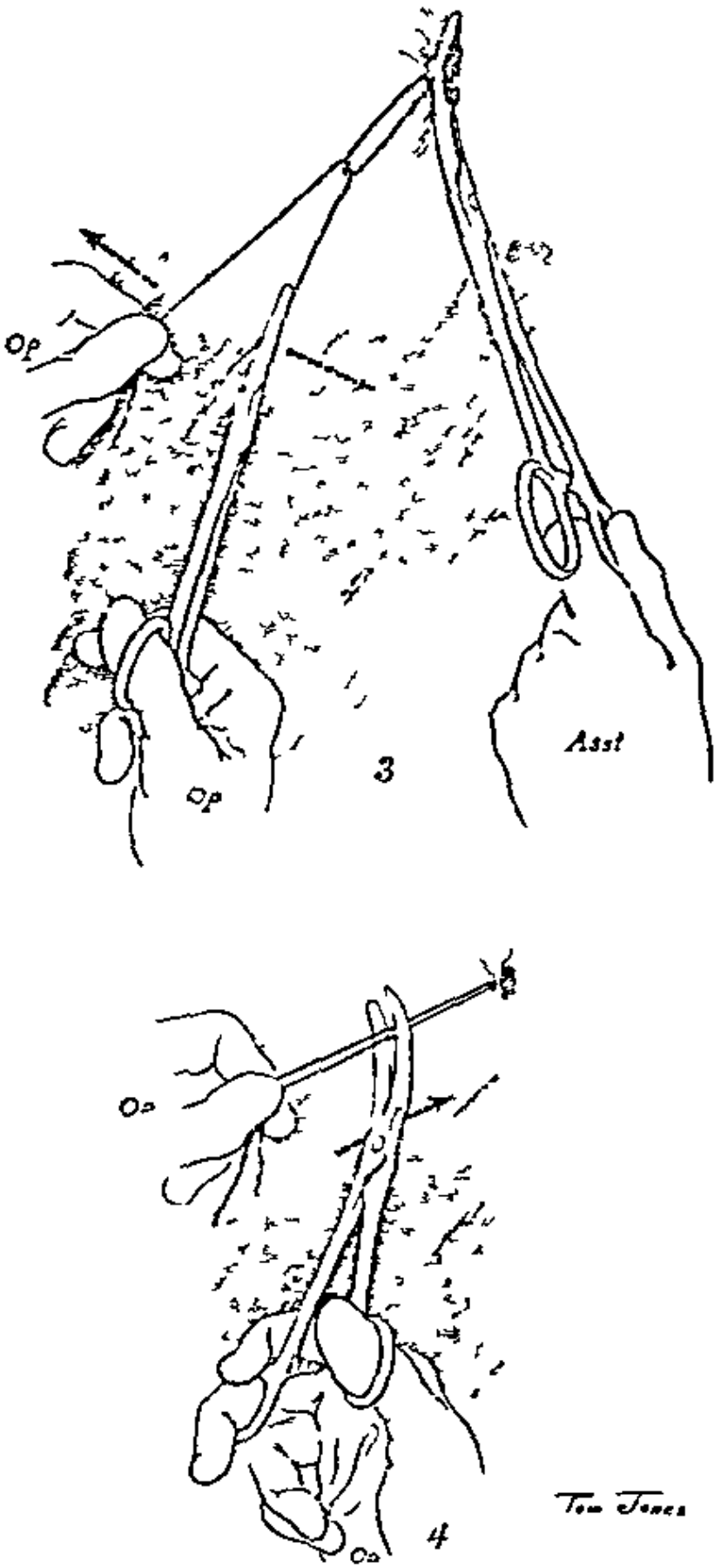

Fig 484.—A convenient method for placing ligatures in regions which are difficult of access.

CLINIC OF DRS DANIEL N EISENDRATH AND MAURICE L GOODKIND

MICHAEL REESE HOSPITAL

SUBACUTE PANCREATITIS (PANCREATIC ABSCESS)

Summary Diagnosis and operation on patient with subacute pancreatitis varieties of pancreatitis producing acute symptoms—definition of terms discussion of the etiology, differential diagnosis and treatment of the different clinical types

ACUTE pancreatitis has until recently been regarded as a disease in which surgical intervention was contraindicated because the impression prevailed that the condition was one which pursued a fulminant course toward an almost inevitably fatal outcome This impression was due to the fact that practically every case which was seen clinically belonged to the hyperacute or, as we now prefer to call it, acute form The diagnosis was seldom made before operation, and the patient was usually seen at a time when toxemia was so profound that death either occurred during the operation or very shortly afterward In cases not operated upon the patients were seen in a moribund condition and it was only at the autopsy table that the diagnosis of the cause of such a grave clinical picture was made A little later we began to recognize or, rather, suspect the existence of these acute cases at a period in their development when operative interference was still to be considered as promising at least a fair percentage of recoveries, and reports of series of successful operations began to appear which greatly surprised those who had felt rather pessimistic about the advisability of operation Quite recently the situation has become still more clarified

The cases which had been formerly operated upon with such a high percentage of mortality have been found to belong to the most virulent or fulminant type of acute pancreatitis in which

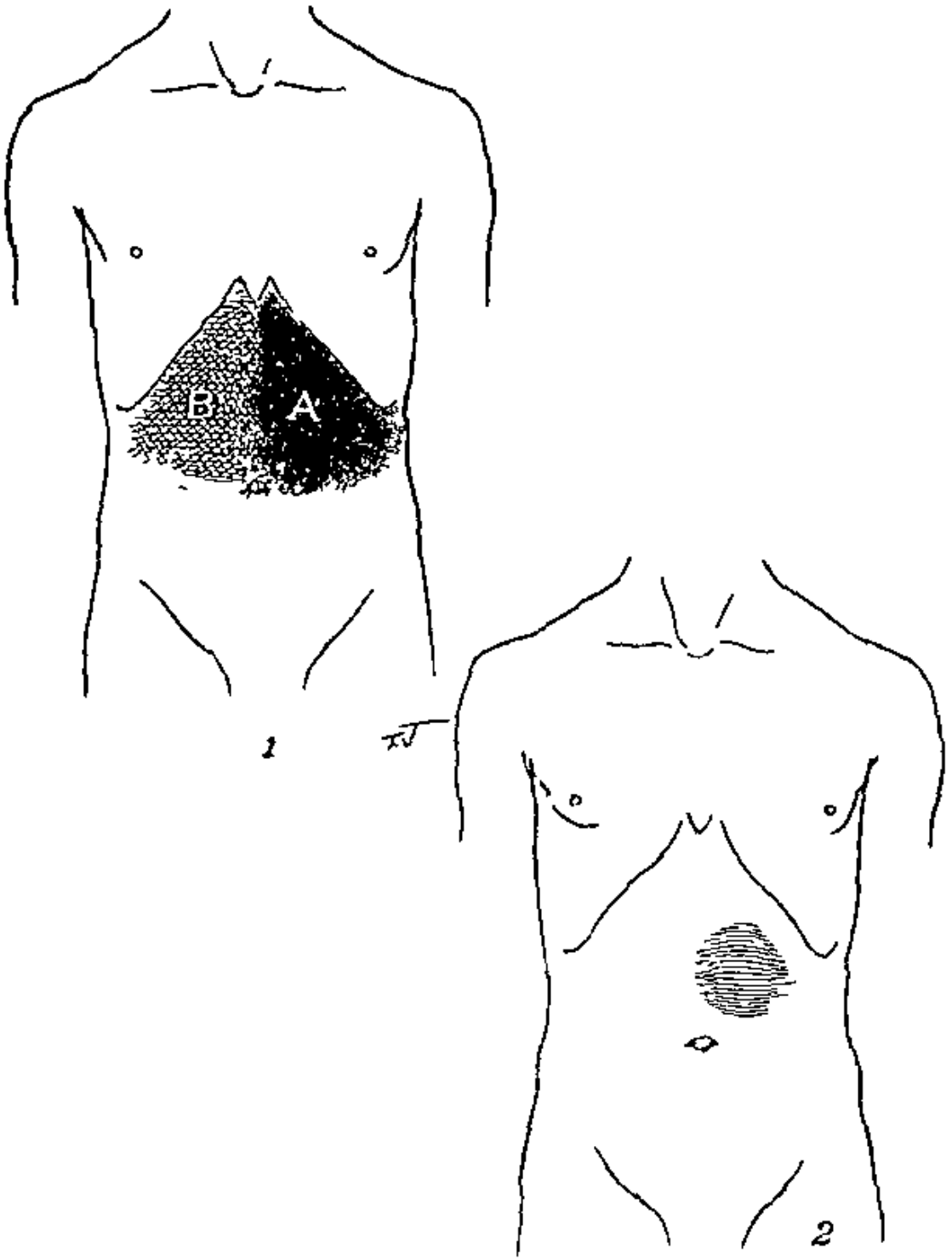

Fig 485.—1, The dark area (*A*) represents the extent of the intense rigidity and tenderness in the left upper quadrant. The lighter area corresponds in extent to the slighter rigidity and tenderness in the right upper quadrant. 2, shaded area showing location of the mass, or localized resistance, felt after patient was anesthetized

most extensive necrosis and hemorrhage go hand in hand. That even these cases are amenable to surgical treatment if recognized early enough is well shown in the reports of Deaver,[1] Linder,[2] and Watts,[3] to which we shall refer again We have begun to recognize, during the past few years, a type of the disease in which the symptoms are not as grave nor the course as fulminant as in the very acute type To this clinical form the term "subacute pancreatitis" or "pancreatic abscess" has been given Our patient of today's clinic belongs in this group. After we have presented the principal features of the clinical history we will discuss the subject of acute and subacute pancreatitis, especially the clinical recognition and treatment of a condition formerly regarded as so discouraging in its operative results

History of Case—The patient, a man of thirty four years became suddenly ill three weeks before admission to the hospital The first symptoms were severe, agonizing pain in the upper abdomen on both sides of the median line, accompanied by vomiting The abdomen became distended and there was marked tenderness and rigidity over its upper half

He was attended at his home by a physician and was not seen by us until the end of the third week At this time he seemed extremely ill, one of the most striking features being the dark reddish blue color of the skin of the face

The leukocyte count was 17,000, temperature, 102° F (rectal), pulse, 130 Examination of the abdomen revealed moderate general distention with marked tenderness in both upper quadrants. The rigidity was board like in the left, but only moderate in the right upper quadrant (Fig 485, 1) The previous history of the patient did not throw any light on the nature of the present trouble There were no symptoms pointing to gall bladder disease or to a duodenal or gastric ulcer *x*-Ray examination showed normal contours and positions of both halves of the diaphragm

[1] Jour Amer Med Assoc., August 11 1917 69 434.
[2] Ibid., September 1 1917 69 718
[3] Annals of Surgery 1918, 67 278.

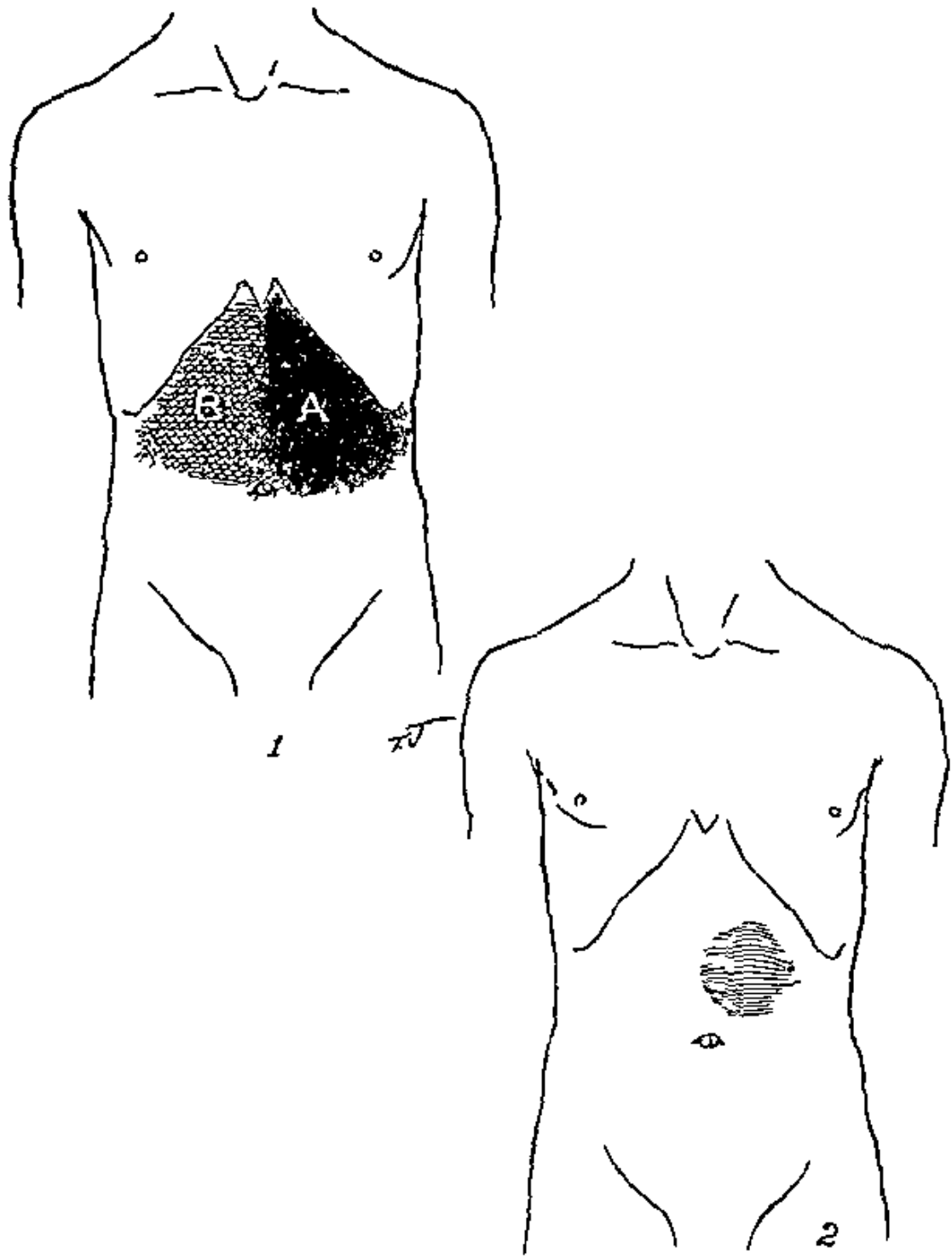

Fig 485.—1, The dark area (*A*) represents the extent of the intense rigidity and tenderness in the left upper quadrant The lighter area corresponds in extent to the slighter rigidity and tenderness in the right upper quadrant, 2 shaded area showing location of the mass, or localized resistance, felt after patient was anesthetized

The clear area just beneath the left dome of the diaphragm due to the 'gas bubble' of the stomach was present. We were thus able to exclude a subphrenic abscess due to perforation of a gastric or duodenal ulcer especially as the movements of the diaphragm as seen during a fluoroscopic examination showed no deviation from the normal

The sudden onset with severe epigastric pain and vomiting followed by symptoms of extreme toxemia without a marked rise in temperature or white blood count and the presence of the exquisitely tender and extremely rigid area in the left upper quadrant led us to suspect the presence of a pancreatic abscess (subacute pancreatitis) The urine was negative as one would expect because glycosuria is rarely if ever a symptom of acute affections of the pancreas. The examination of the stools also failed to be of aid We have learned from repeated observations that the Cammidge reaction is of no value even in chronic pancreatitis Undigested meat fibers or fatty stools are rarely of any assistance from a diagnostic standpoint in acute pancreatitis since these are usually found in the chronic forms of the disease

Our diagnosis before operation rested between subacute pancreatitis and perforation of a gastric ulcer with formation of an abscess between the stomach and the anterior abdominal wall.

Under anesthesia we felt a mass (Fig 485 2) or localized resistance to the left of the median line midway between the umbilicus and costal arch An incision was made through the left rectus muscle directly over this area Upon opening the peritoneal cavity the gastrocolic portion of the omentum was found adherent to the parietal peritoneum at the lower two-thirds of the incision, while at the upper third the stomach which was not adherent presented Two small white areas of fat necrosis on the surface of the bulging adherent omentum confirmed the diagnosis of some acute or subacute pancreatic involvement (Fig 486) The anterior wall of the stomach was sutured to the parietal peritoneum thus walling off the general peritoneal cavity An incision was then made through the gastrocolic omentum and an artery forceps inserted (Figs 486 487) Upon

spreading its blades a large quantity of turbid fluid like dirty dishwater containing many flocculi of whitish material escaped Digital examination of the cavity from which this fluid came revealed the fact that it was behind the stomach and its posterior

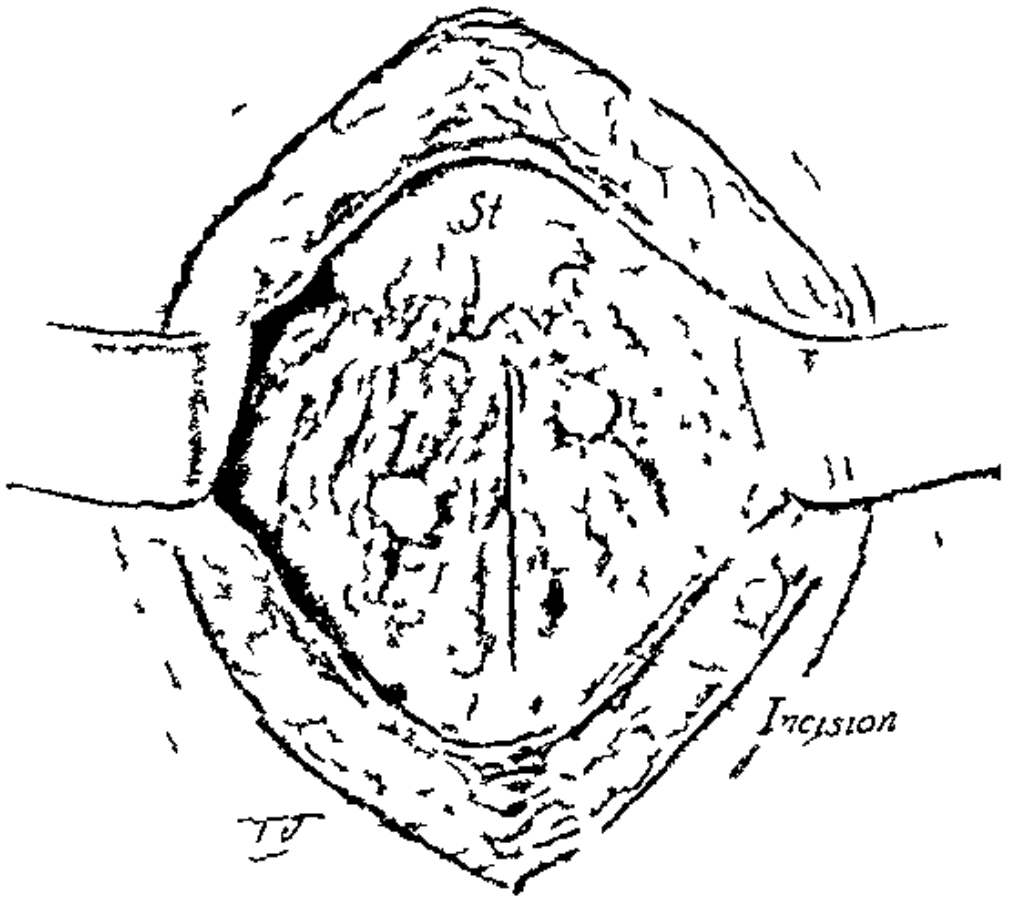

Fig 486—Incision made in the bulging gastrocolic omentum Note the two white spots corresponding to areas of fat necrosis so characteristic of acute pancreatitis The white color is the result of the action of the pancreatic fat splitting ferment upon the omental fat with saponification of the latter

wall formed by the greatly swollen and softened pancreas A large rubber tube was inserted (Fig 487) and the abdominal incision closed around it Cultures taken from the fluid remained sterile

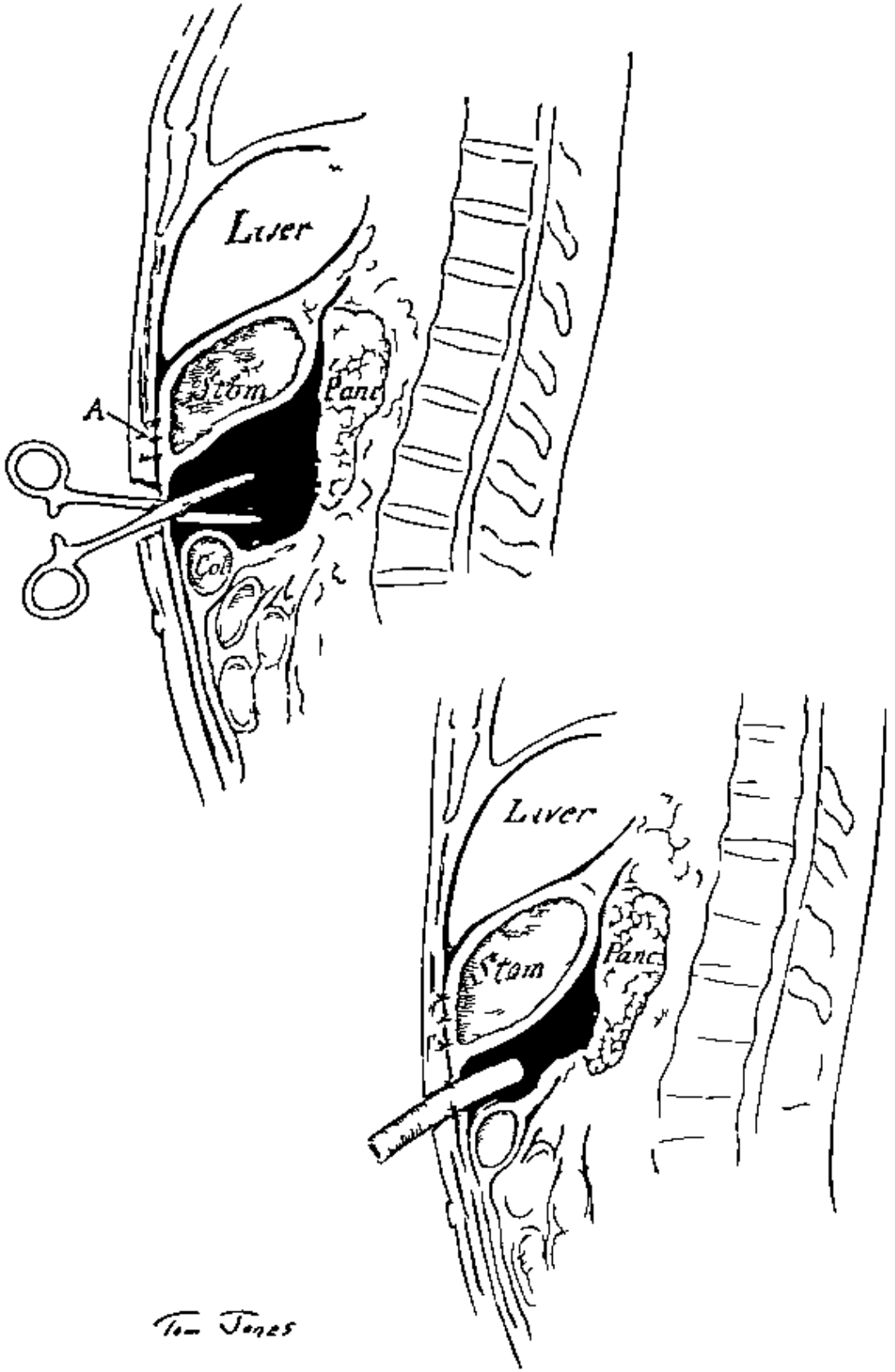

Fig 49

Archibald[1] states that the pancreas is rarely the seat of a bacterial inflammation Cultures from all but the frank abscesses which are rare, are usually sterile Even from some of the abscesses the cultures are sterile, so it is not surprising to have this finding in our case

Chemical examination of the fluid showed that it was of pancreatic origin

During his convalescence this patient had at one time a recurrence of his former symptoms which required prolonged drainage of the abscess cavity He has resumed his former occupation and appears perfectly well today

DISCUSSION OF ACUTE AND SUBACUTE PANCREATITIS

Opie and Meakins have shown that the real lesion in acute pancreatitis is necrosis of the cells of the parenchyma Hemorrhage (which is such an important feature of the pathologic changes in the fulminant type of the disease), gangrene, and suppuration are merely complications and may not appear at all Extensive necrosis may result in sloughing of the greater portion of the organ Infection of the necrotic area may result in abscess formation

In the etiology of the condition the most important sources are the following

1 Infections of the biliary tract This is the theory of Mau geret, supported by Arnsperger and Deaver Infection travels, according to this view, by way of the lymphatics Archibald does not believe in this retrograde route because the pancreas is rarely the seat of a bacterial inflammation, cultures, as was stated above, being usually sterile

2 Hematogenous route This theory is held by some who

[1] Surgery Gynecology and Obstetrics 1918 28 529

Fig 487 —In the upper figure the method employed in opening the pancreatic abscess is shown After making an incision through the bulging

believe that acute pancreatitis occurring during mumps typhoid etc can best be explained upon this basis

3 The necrosis is the result of the direct action of the bile salts and it is not necessary to assume an activation of the normal pancreatic ferments This is the theory of Opie Flexner and Archibald The latter has recently[1] published experiments in which he produced acute and subacute hemorrhagic pancreatitis by forcing infected bile into the pancreatic duct The sphincter of Oddi at the ampulla of Vater plays an important direct rôle by increasing the intraductal pressure The extent of the pancreatic necrosis is determined at the onset by the grade of virulence and extent of permeation of the noxious agent

It is of interest to clinicians in connection with this last theory that three conditions must be present before actual damage will be done first a change in bile composition increasing the proportion of bile salts second undue resistance perhaps resulting from spasm of the common duct sphincter and third abnormal rise of the pressure in the biliary system Gall stones probably bring about an increase in bile salts and in infected bile it is rather the chemical change produced by the action of bacterial growth than the bacteria in their infecting capacity that causes the pancreatic lesion according to Archibald

CLINICAL TYPES

I Acute Pancreatitis (Called by Deaver Ultra acute) — The most important symptoms are (*a*) Extreme toxemia as evidenced by cyanosis rapid small pulse cold clammy sweat shallow respiration and subnormal temperature (*b*) Severe epigastric pain Tenderness and rigidity are not marked in these acute cases and may be absent Vomiting is a prominent symptom Glycosuria appears so late as to be of little value in the diagnosis of the very acute cases

The onset is very sudden the first symptom being the severe epigastric pain followed rapidly by the symptoms of collapse or shock due to the toxemia

In the differential diagnosis of the acute fulminant cases we

[1] Vide supra

must consider (1) Perforation of the gall bladder, or of a gastric or duodenal ulcer In these board like rigidity is an early symptom The initial pain is as a rule, not as severe, and the symptoms of toxemia develop much more slowly than in pancreatitis There is in addition, often a history of preceding ulcer or gall bladder trouble

(2) Ileus The vomiting in ileus recurs at frequent intervals, abdominal distention occurs earlier, and the vomiting within twenty four to thirty six hours becomes stercoraceous

(3 and 4) Mesenteric embolism and thrombosis and acute gall bladder infection must also be considered, but their differentiation is a much easier task

II **Subacute Pancreatitis or Pancreatic Abscess** —The onset is quite similar to that observed in the acute type, but it is not as severe, and the subsequent symptoms are also greatly modified in their intensity

After the subsidence of the initial severe symptoms, however, the toxemia persists the patient still appears extremely ill, and the appearance of fever with leukocytosis and of rigidity and tenderness in the epigastrium serve to indicate a localization of the process

TREATMENT

1 **Acute Cases** —As we stated at the beginning of this lecture the acute cases (ultra acute of Deaver) were formerly regarded as hopeless In the first series of 16 consecutive cases reported by Linder[1] operated to June, 1915, the mortality was 62 5 per cent In the second series of 15 cases since June 1915, the diagnosis having been made in 75 per cent , there was a mortality of only 13 6 per cent

In Deaver's[2] last 13 cases 3 (23 per cent) died, 1 of these was hopeless and in 2 drainage of the biliary tract did not prevent a fatal outcome

At operation in these acute fulminant cases we find fat necrosis an odorless beef broth fluid and a greatly swollen pancreas There are two avenues of approach to the acutely inflamed pancreas either through an incision in the gastrohepatic

[1] Vide supra [2] Vide supra

omentum or through the gastrocolic omentum (Fig 486) Multiple punctures are made and gauze or rubber tube drains inserted

2 Subacute Cases —In these it is best to pursue the plan employed in the case we have shown you today, namely to incise over the tender mass in the epigastrium often to the left of the median line Unless the gastrocolic or gastrohepatic omentum is adherent to the abdominal wall as in our case it is necessary to wall off with gauze in order to prevent escape of the extremely toxic fluid into the general peritoneal cavity In these subacute cases the characteristic beef broth fluid seen in the very acute cases is absent

Areas of fat necrosis which are present in large numbers in the acute cases are not as common in the subacute cases but when present are pathognomonic of pancreatic inflammation At times a counter drain may need to be inserted the point of election *being the left costovertebral angle*

This case of subacute pancreatitis shows how necessary it is to bear in mind this most interesting disease in the differential diagnosis of acute abdominal conditions

CLINIC OF DR ALBERT J OCHSNER

AUGUSTANA HOSPITAL

TRANSGASTRIC CAUTERIZATION OF CRATER ULCER ON POSTERIOR WALL OF STOMACH

Summary Patient sixty years of age cachectic giving a history of gastric ulcer of several years duration d scovery at operation of old indurated ulcer on posterior wall of stomach adherent to retroperitoneal structures cauterization of ulcer by transgastric route—reasons for adopting this procedure

THE patient a married woman aged sixty, was admitted to the hospital July 13 1919

Family History—Mother died at forty eight from what was thought to be some form of gastric disturbance The family history is otherwise negative with reference to stomach trouble

Past History—Two years ago patient was treated for gastric ulcer with apparently much improvement

Present Complaint—The chief complaints are pain in the epigastrium just above and to the left of the umbilicus, nausea and vomiting coming on immediately after eating, marked loss of weight since onset of pain, inability to retain food The pain is cutting in character radiating to shoulders and sides and is constantly present The pain is made worse by the taking of food

Physical examination is negative except for a definite pain point in the epigastrium just above and to the left of the um bilicus Palpation elicits an indefinite mass in this location

This patient was under treatment in this hospital two years ago for ulcer of the stomach At that time operative treatment was recommended but the patient could not muster up the neces sary courage Consequently she was placed on an alkaline diet, under which her condition improved considerably but she was

never able to regain her former weight Recently her suffering has been intense the pain being located above and to the left of the umbilicus and extending into the back One of the marked features in her case is an inclination to vomit almost immediately after she has swallowed food the moment the food touches the stomach the latter shows a tendency to expel it We have observed this condition especially in cases in which the ulcer is located nearly opposite the entrance of the esophagus There can be no doubt that this condition began as an ulcer It is however practically impossible to tell whether the condition is still in the form of an ulcer or whether it has degenerated into a carcinoma The severe emaciation would in either case be due to the fact that it is practically impossible for her to retain any considerable amount of food of any kind Our inclination would be toward a diagnosis of carcinoma and if this diagnosis is confirmed by exploratory operation then the operation will have been of no benefit to the patient because there is no pyloric obstruction which can be removed by operative measures and the location of the tumor will probably preclude the possibility of its removal In the case of inoperable carcinoma obstructing the pylorus the patient can of course be greatly benefited by gastro-enterostomy which will enable the patient to retain nourishment However an exploratory operation cannot reduce this patient s chances of recovery to any considerable degree and therefore we seem fully justified in making one

We have not observed the patient for nearly two years as she was under the care of a local physician but the x ray examination at the time she was here before clearly located the ulcer Consequently it will not be wise to subject the patient to the wear and tear which would result from another barium meal and x ray examination especially in view of the fact that the clinical history and physical examination clearly establish the diagnosis so far as the ulcer and its location are concerned and x ray examination would not be at all reliable with an ulcer in this location for the purpose of determining the malignancy or non malignancy of the ulcer For the same reason we have

not repeated the chemical examination of the stomach contents Whatever the result of such examination might be it would not add anything of benefit to our patient and the irritation due to the introduction of the stomach tube might do a considerable amount of harm

Her mouth has been thoroughly disinfected and she has received 2 ounces of castor oil and no food with the exception of broth for twenty four hours so that the stomach and intestines are as free from infectious material as it is possible to make them with safety to the patient

Operation —An incision is made from the sternum to a point 3 cm below the umbilicus in order to expose the stomach thoroughly The gall bladder and ducts are first examined by palpation then the duodenum pylorus appendix and pelvic organs All these are found to be normal The only abnormal condition consists of a broad indurated mass 7 cm in diameter with a central deep depression about 2 to 3 cm in diameter The entire mass is located in the posterior wall of the stomach to the left of its middle and is strongly adherent to the pancreas and to the tissues above this organ One receives the impression that the tumor mass consists of a gastric ulcer on the posterior wall of the stomach which has perforated into the pancreas and has caused adhesion of the middle three fifths of the stomach to the posterior abdominal wall It is still impossible to tell definitely whether this ulcer has undergone malignant degeneration or not but one obtains the impression that one has to deal with a malignant condition Under these conditions it is quite clear that it would be entirely impossible to remove this growth because of the involvement of so large a portion of the posterior wall of the stomach because of the extensive infiltration of the underlying tissues and particularly because of the involvement of the underlying pancreas It seems however worth while to lay open the stomach and examine the mass by direct inspection

We will consequently make an incision through the anterior wall of the stomach for a distance of 7 cm (Fig 488 1) This portion of the stomach is its least vascular part consequently we need not anticipate much hemorrhage In order to keep the

never able to regain her former weight. Recently her suffering has been intense the pain being located above and to the left of the umbilicus and extending into the back. One of the marked features in her case is an inclination to vomit almost immediately after she has swallowed food the moment the food touches the stomach the latter shows a tendency to expel it. We have observed this condition especially in cases in which the ulcer is located nearly opposite the entrance of the esophagus There can be no doubt that this condition began as an ulcer It is however practically impossible to tell whether the condition is still in the form of an ulcer or whether it has degenerated into a carcinoma The severe emaciation would in either case be due to the fact that it is practically impossible for her to retain any considerable amount of food of any kind Our inclination would be toward a diagnosis of carcinoma and if this diagnosis is confirmed by exploratory operation then the operation will have been of no benefit to the patient because there is no pyloric obstruction which can be removed by operative measures and the location of the tumor will probably preclude the possibility of its removal. In the case of inoperable carcinoma obstructing the pylorus the patient can of course be greatly benefited by gastro-enterostomy which will enable the patient to retain nourishment However an exploratory operation cannot reduce this patient s chances of recovery to any considerable degree and therefore we seem fully justified in making one

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edges of this incision as little traumatized as possible we place mouse tooth forceps of the Allis pattern upon the edge of the wound about 2 cm apart grasping all the layers of the stomach wall so that the mucous membrane may not be separated from the muscularis during our manipulations (Fig 488 2) Then we place broad Jackson vaginal specula into the stomach through this wound and in this way expose the ulcer perfectly (Fig 488 3) illuminating the field by placing a strong electric light directly over the incision Even at the present time with the ulcer fully in view it is impossible to determine positively whether the condition is simply an indurated ulcer or whether carcinomatous infection has taken place upon its surface

The only treatment which promises benefit to the patient is cauterization of the ulcerated area with the electric or actual cautery Because of the extreme vascularity of the tissues it seems best to destroy the edge by means of the bright heat of the cautery The entire ulcerated surface is being cauterized until every portion is covered with an eschar to the distance of about 1 cm from the original edge of the ulcer (Fig 489 4) The dull heat has prevented the occurrence of hemorrhage The little mucus that has been secreted by the surrounding mucosa has been sponged away constantly so that we now have a perfectly clean crater in place of the original ulcer (Fig 489 5) It seems as though the amount of destruction of tissue with the cautery may have killed any cancerous invasion that may have taken place upon the surface of this ulcer and consequently this form of treatment seems to give the patient the best chance of recovery even in the case of extensive cancerous degeneration of the ulcer It would of course have been interesting to remove a portion of the edge of this ulcer for microscopic examination because in that manner we could have been positive about the diagnosis but with the patient in her very low physical condition this would have added additional risk which does not seem warranted Moreover unless we had removed a portion of every part of the ulcerated surface negative findings would have been of no value because in these ulcers we frequently find one portion infected by cancer while other portions are still free There

Fig 488.—Exposure of ulcer in posterior wall of stomach through an anterior incision

is a considerable amount of danger from hemorrhage in these cases at the time the eschar is loosening, and in order to guard against this in a measure I will place a number of interrupted sutures of chromicized catgut for the purpose of bringing the edges of this eschar together I will use No 3 catgut of the variety that will hold in ordinary tissues about thirty days In the presence of the gastric juices it will, of course, not hold for so long a period It seems unwise to use silk in this location for fear of future irritation, and consequently we will depend upon this chromicized catgut (Fig 489 5, 6)

The incision into the stomach is now carefully closed with two rows of sutures and the abdominal wound is closed in the usual manner The entire operation has consumed about forty minutes, so that the patient is in nearly as good condition as when the operation was begun because great care has been taken not to traumatize the intra abdominal organs

The patient will be supported by the use of nourishing enemas From the third day on gruels will be given by mouth every two hours, with the addition of from ½ to 1 teaspoonful of milk of magnesia or in case this acts too freely upon the bowels ½ ounce of lime water will be substituted for each dram of the milk of magnesia In case of vomiting gastric lavage with the water at 105° F will be given The head of the bed will be elevated in order to prevent congestion of the lungs In case of great thirst normal salt solution will be injected subcutaneously to the amount of 1000 to 1500 c c from two to three times a day if necessary

Note—October 6 1919 Twelve weeks after operation the patient is out of bed and able to take non irritating food Her

more than supply the amount needed for maintaining her present condition

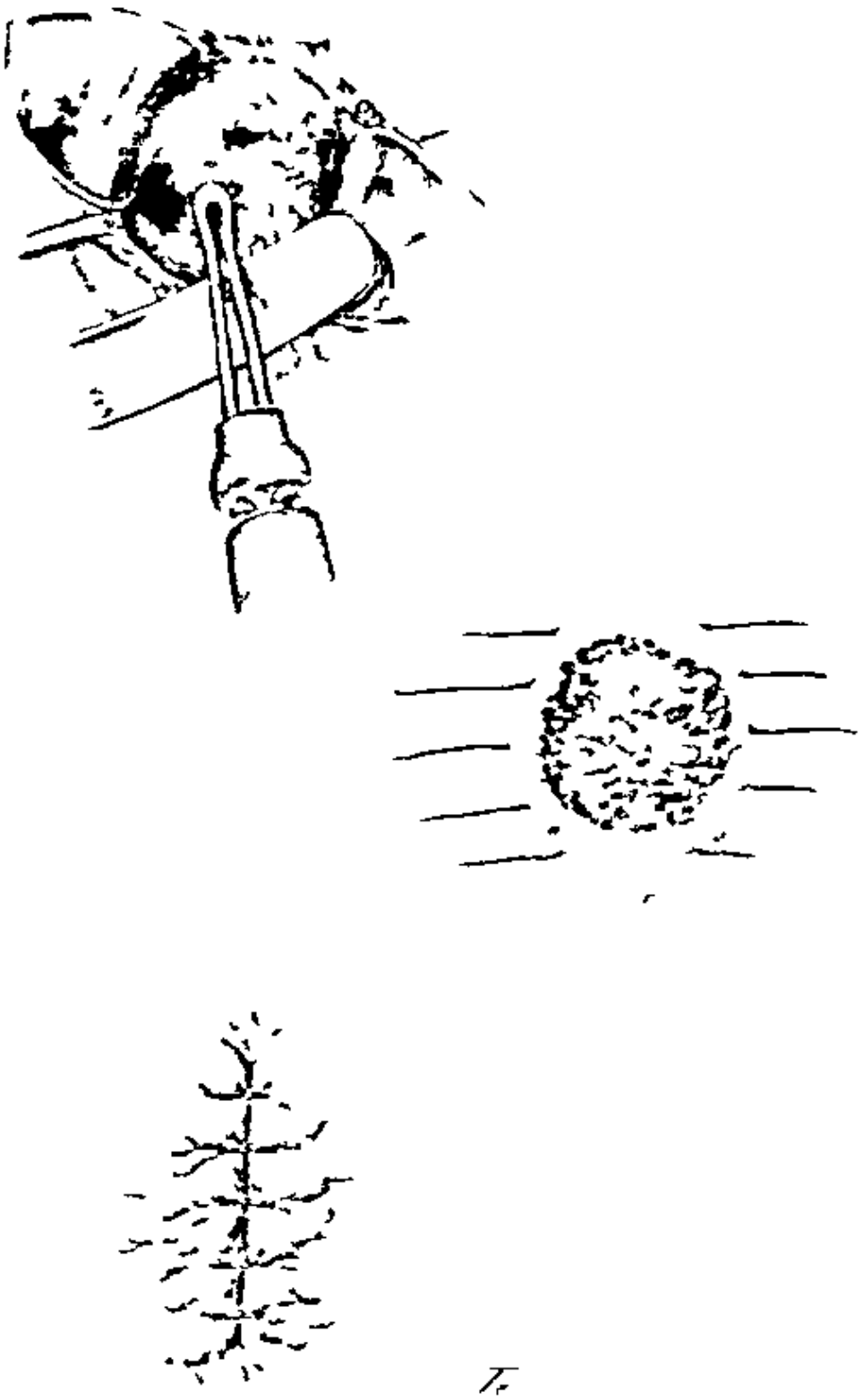

Fig 489.—Cauterization of ulcer and closure of defect by sutures

CLINIC OF DR ALFRED A STRAUSS

MICHAEL REESE HOSPITAL

SURGICAL TREATMENT OF GASTRIC ULCER WITH NEW METHOD OF PYLOROPLASTY

Summary Reasons for failure of simple gastro-enterostomy in treatment of gastric ulcer arguments against partial gastrectomy local excision of ulcers—why desirable pyloroplasty to prevent pylorospasm and ensure adequate drainage of stomach technic of combined excision and pyloroplasty

THIS morning we have for operation one patient with gastric ulcer of the lesser curvature and another with duodenal ulcer

The types of operation for ulcer of the lesser curvature have varied from extreme partial gastrectomy to simple gastro-enterostomy I have been very much impressed by the statements made by medical men who have had the after-care of these patients They state that those who have their ulcers excised respond better have fewer symptoms while recovering from the operation, and are practically cured, those who have a simple gastro enterostomy have a more protracted course of symptoms after operation, and many of them show very little improvement When this operation was first employed surgeons performed it because they believed that it would produce drainage from the stomach to such an extent that all the food would go through this opening and none through the normal pyloric opening Since then many advances have been made in our knowledge of the physiology of the stomach and also in the pathology of ulcer through fluoroscopic and Roentgen ray examinations In all these studies it has been proved that a stomach with a gastro-enterostomy functionates in an entirely different manner from that intended by the original operation namely that instead of the food passing through the gastro

The only reason that ulcers on the lesser curvature are not excised more frequently is that they are difficult to excise, and when it is attempted excision produces so much mutilation that it is necessary to remove the entire pyloric segment A number of men here and abroad, especially Rodman and Deaver, have carried out the principle of always excising the ulcer by doing a partial gastrectomy and then performing gastroenterostomy The principle of excising the ulcer is correct, but to excise the ulcer and with it take the most important part of the stomach, as they do in partial gastrectomy, is wrong

Thalhimer and Wilensky, also McCarty, of the Mayo Clinic, have shown that in ulcers of the lesser curvature undergoing *malignant change the cancer does not extend beyond the* point of induration, and Wilensky especially has shown by serial section that when you cut from 1 to 2 cm beyond the indurated area of the ulcer the muscularis and mucosa of the stomach are perfectly normal I, therefore, want to emphasize the fact that whether an ulcer is malignant or benign if you excise it for a centimeter or two beyond the indurated area you have done as radical a removal for practical purposes as if you had removed half the stomach

The ideal object of any surgical procedure should be to do away with the pathologic condition and leave the organ in as nearly normal anatomic condition and physiologic relationship as possible In doing partial gastrectomy for lesser curvature ulcer some men leave only the body of the stomach, whose function we know to be entirely different from that of the pylorus The fact that the patient lives in spite of this does not prove the operation to be justifiable We know that the body and fundus of the stomach during the process of digestion are in a state of tonic contraction throwing the food out in small portions into the pyloric antrum or vestibule. If that *portion is cut off*, as it is in partial gastrectomy, the tonic contractions of the body and fundus on the gastro enterostomy placed in that locality causes the stomach to empty within twenty to thirty minutes This certainly must be an abnormal condition for it is the function of the stomach to retain food from three to eight hours where

enterostomy opening, less than 50 per cent. passes through it, while the greater amount still passes through the normal pyloric opening Simple gastro-enterostomy for gastric ulcer is of very little value because practically all the food that passed along the lesser curvature before operation still passes along the lesser curvature after operation

The advocates of simple gastro-enterostomy for lesser curvature ulcer claim that there is regurgitation of bile through the gastro-enterostomy opening into the stomach which has a curative value in healing the ulcer by reducing the acidity of the stomach When we consider the physiology of digestion in its relationship to the flow of bile this theory of regurgitation and reduction of acidity becomes very doubtful The bile and pancreatic secretion mixes with the 50 per cent or more of food which comes through the pylorus This passes on into the jejunum and not through the gastro-enterostomy opening Practically no bile can regurgitate into the stomach during the process of digestion and the only time bile may regurgitate into the gastro-enterostomy opening is at night when the patient is at rest and his stomach is empty We know that when the stomach is empty the bile flows back into the gall bladder instead of flowing into the duodenum, and the gall bladder only discharges its bile into the common duct when there is a reflex stimulus produced by food passing through the duodenum More than that, if enough bile would pass on through the gastro-enterostomy opening to produce a curative effect such an amount of bile would nauseate the patient and give symptoms of a vicious circle I would also add that the fractional test meals in simple gastro-enterostomized patients have shown very little change in their acidity, and very few of them reveal the presence of bile in the aspirated contents four to six weeks after operation.

Considering the relationship of ulcer to cancer I know from clinical and pathologic experience that many ulcers which appear benign at the time of operation are found upon microscopic examination to have undergone malignant changes There can be very little argument in favor of doing a gastro-enterostomy on a patient with such an ulcer

have come to a normal or subnormal acidity within three to five weeks This speaks volumes for the fact that hyperacidity and hypersecretion are the results of ulcer rather than the cause or etiologic factor in its production This also supports Rosenow s theory of infection

I, therefore want to repeat for the sake of emphasis the reasons why I believe that all gastric ulcers should be treated by a simple method of excision in conjunction with pyloroplasty instead of gastro enterostomy

1 It is absolutely impossible in many instances to tell at the time of operation whether the ulcer is benign or malignant

2 In excised ulcers it is possible to demonstrate organisms just as in an infected gall bladder or appendix, therefore the same surgical principle that holds good for the latter should hold good for the former

3 In a series of 16 patients who had marked hyperacidity before operation all had normal or subnormal acidity after ulcer excision This demonstrates that the ulcers cause the abnormal secretions rather than that the abnormal secretions caused the ulcer It also supports Rosenow s theory that ulcer is a localized infection and abnormalities in the secretion are the results of it

4 By excising the ulcer and only removing the pathologic tissue we rid the patient of his lesion and leave the organ intact to carry on its important normal physiologic function

5 I will demonstrate to you in a moment that by performing simple pyloroplasty in conjunction with ulcer excision instead of gastro enterostomy we give the stomach a quick emptying time (one half the normal) This prevents hyperacidity and continued hypersecretion and leaves the stomach and duodenum in their normal anatomic and physiologic relationships

6 The combined operation of ulcer excision and pyloroplasty takes less time than gastro enterostomy or any other type of operation takes less surgical skill and produces less shock to the patient

The clinical course in a large number of cases that I have operated by this method has been most satisfactory The patients are placed in Fowler s position as soon as they are out

it undergoes certain forms of digestion passing into the intestine in small bits and not jamming through the gastro-enterostomy opening in twenty to thirty minutes

Mayo, Küttner, Hartmann, and Payr have practised excision of ulcers of the lesser curvature and found that the stomach did not empty itself properly owing to pylorospasm, which was noted in a large number of patients, for this reason, in several instances, they have either had to perform gastro-enterostomy at a second operation or to remove in the first operation the entire segment of the stomach in which the ulcer occurred

I am sure that gastro-enterostomy is entirely unnecessary to prevent pylorospasm or to give the stomach a quicker emptying time This can be accomplished by a simple pyloroplasty in which I remove a small portion of the sphincter muscle of the pyloric ring This relieves the spastic condition of the pylorus does away with the sphincter control of the pylorus, and allows the stomach to empty in about half its normal time I have practised this in the last five years and have had no occasion in any of these cases to resort to gastro-enterostomy for the purpose of relieving pylorospasm after doing pyloroplasty in conjunction with excision of ulcers on the lesser curvature

It will be noted from the experience of all these surgeons that excision of the ulcer would be the most logical procedure if it did not require too much additional surgery and mutilation of the stomach This is especially true when we consider the problem of the relationship of ulcer to cancer and the work of Rosenow, who has demonstrated that ulcers of the stomach are lesions produced by streptococcic infection similar to lesions in an inflamed gall bladder and inflamed appendix If this is true, then there can be no valid reason why an ulcer of the stomach should not be treated the same as a chronically inflamed gall bladder or inflamed appendix namely by excision

One more point which I want to call to your attention is that in 16 cases of gastric ulcer which had marked hyperacidity ranging from 100 to 160 free HCl before operation and in which the ulcers were excised and pyloroplasty performed the fractional test meal after operation revealed the secretion to

have come to a normal or subnormal acidity within three to five weeks This speaks volumes for the fact that hyperacidity and hypersecretion are the results of ulcer rather than the cause or etiologic factor in its production This also supports Rosenow s theory of infection

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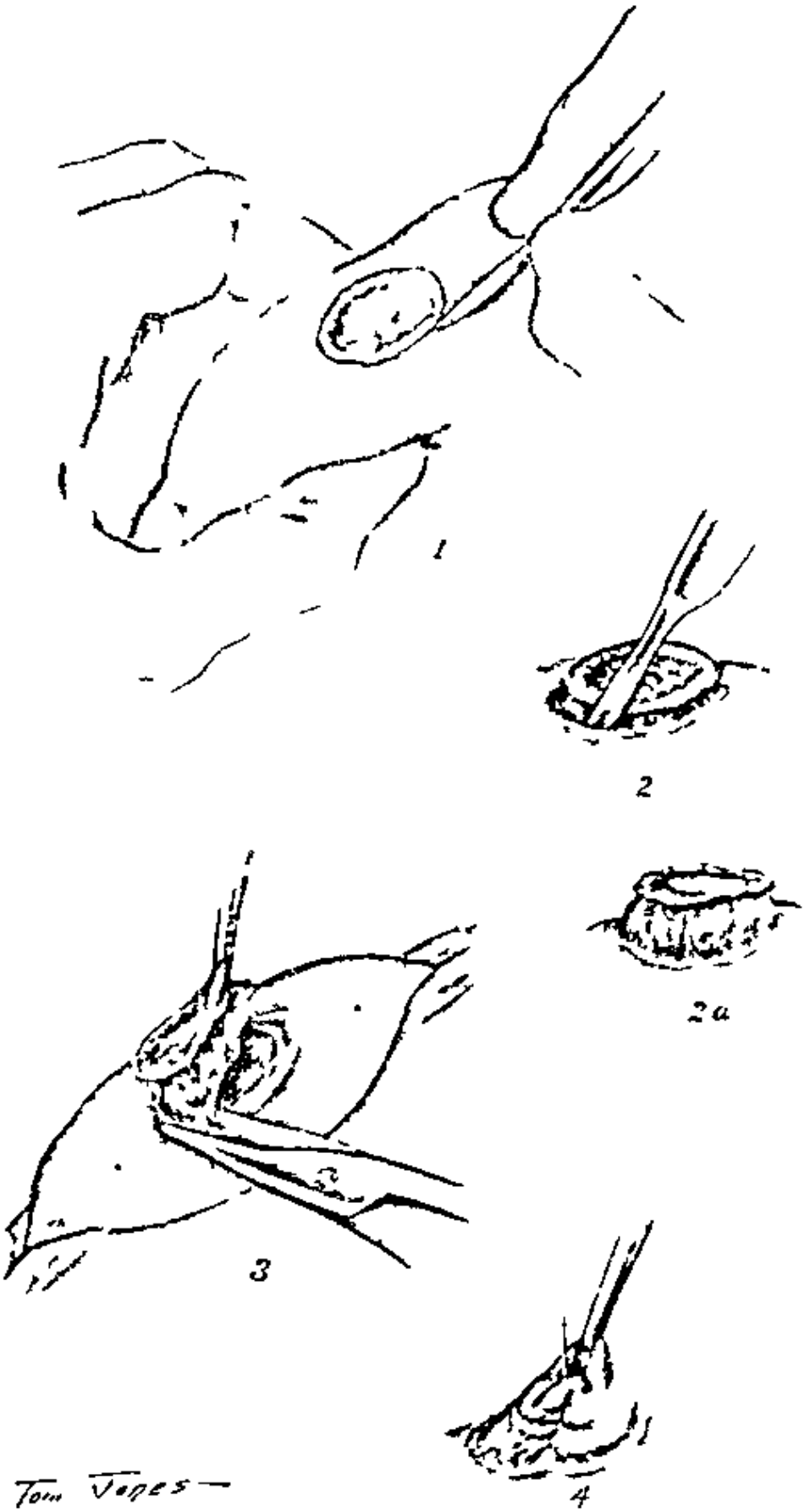

Fig 490

of the anesthetic They have no gas pains, and none of them seem to vomit or have gastric distress They are not allowed anything by mouth for forty eight hours, instead, they receive 1 quart of Ringer's solution intravenously and 1 quart of 5 per cent glucose per rectum in twenty four hours for two days I do not allow water by mouth for forty eight hours because, first, withholding water keeps the stomach dry and prevents nausea and vomiting and second experimental work on dogs demon strates that early administration of water interferes with healing by reason of the fact that the stitch holes and sutured area be come water soaked although leaking does not occur At the end of forty eight hours the patients are allowed milk and cream in 1 and 2 ounce doses the fifth day a light soft diet, the eighth day soft diet, and at the end of the second week a full diet

I do not give sodium bicarbonate or calcined magnesia The patient needs no medical care or special diet because he has now a normally functioning stomach The only symptom that these patients complain of is marked hunger which is probably due to the rapid emptying of the stomach

It is interesting that all these patients that we followed up have gained very rapidly in weight and are able to eat all kinds of food

Fluoroscopic examination four years after operation showed that they all have an emptying time from one and one half to three hours I believe this is an important factor and explains why these patients are free from gastric symptoms without medical aid or alkalies

I shall demonstrate to you this morning the type of opera tion which I perform on these cases

The patient a man forty years of age gives a history of hav

Fig 490 —1 Ell pt c incision around indurated ulcer area extend ng through

the longitud na

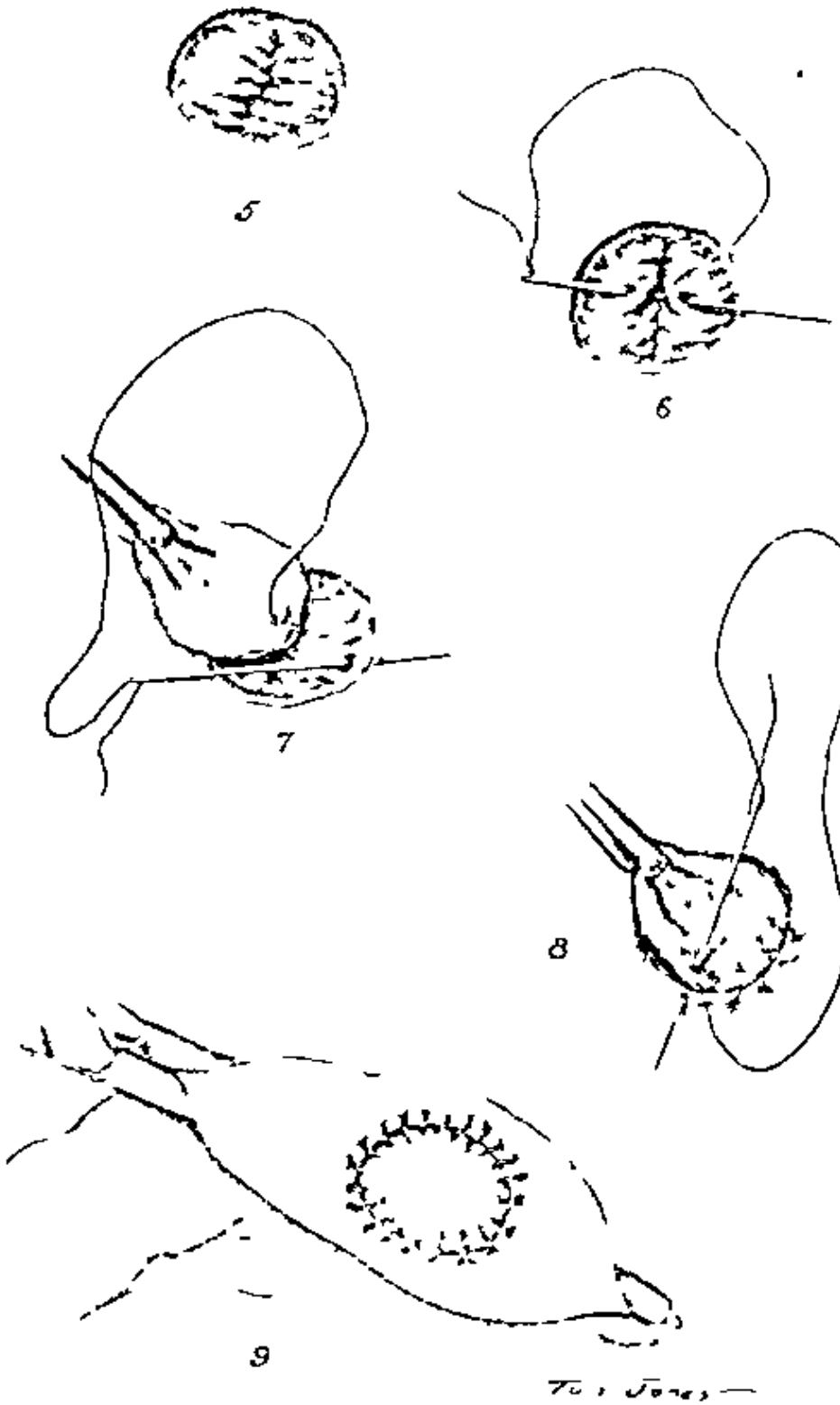

Fig 491

ing undergone medical treatment on three different occasions by a competent medical man He was relieved only a short time after each course of treatment the symptoms recurring with the same intensity shortly afterward *x* Ray examination reveals a typical pyramid on the lesser curvature about 2 inches from the pyloric ring

I shall now make a midline incision reaching from the ensiform cartilage to the umbilicus On opening the abdomen I find the gall bladder and duodenum perfectly free The gall bladder appears pearl blue easily compressible and no stones are found in it On placing my finger in the foramen of Winslow I am able to palpate the common duct and pancreas and find it to be perfectly normal Here we have the pyloric ring notice the vein which indicates the first part of the duodenum The pylorus easily admits the index finger and is perfectly free from thickening or infiltration On examining the lesser curvature we find a markedly indurated area and by holding this area between the thumb and index finger I find a typical nest shaped ulcer This is hard and indurated and its edges are infiltrated Beyond the indurated edge the stomach is perfectly normal A ligature is now placed upon the gastric arteries of the lesser curvature well beyond each end of the indurated area I now make an elliptic incision around the indurated area of the ulcer through the muscularis down to the mucosa (Fig 490 1) A scalpel is now placed between the mucosa and muscularis and several strokes around this area (Fig 490 2) frees the mucosa from the muscularis so it balloons up like a pouch (Fig 490 2*a*) The indurated area is now free and one can see the normal mucosa which has been freed with the scalpel beyond the indurated area (Fig 490 2*a*) A stomach clamp is now applied and the ulcer is cut away with fine scissors (Fig 490 3) The mucosa

suture

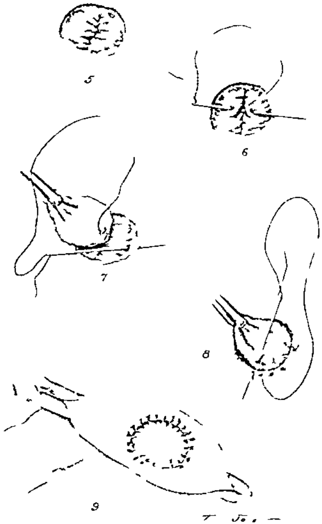

Fig 401

is carefully examined, and any portion which looks pathologic is trimmed away The mucosa is now closed separately with a Connell suture (Figs 490 4, 491 5) and reinforced by a Lembert suture (Fig 491 6) If the ulcer were of small size the musculature could now be closed by simple suturing or by a Lembert suture and the omentum brought over this area but as the ulcer is of large size it would be very difficult to bring the muscularis together without producing marked deformity of the lesser curvature For this reason I now take an oval shaped piece of fascia lata from the thigh which is imbricated between the mucosa and muscularis (Fig 491, 7) This is accomplished by a simple over and over suture of black waxed silk (Fig 491, 8 9)

Now that the ulcer is excised the next step is to see that the stomach empties quickly Most men now do a second major operation gastro enterostomy which I believe is entirely unnecessary The procedure which I follow is that of simple pyloroplasty which takes away the sphincter muscle of the pyloric ring This simple operation which takes less than five minutes gives the stomach an emptying time of half the normal, does away with pylorospasm and allows gastric peristalsis to flush the food through the paralyzed ring In about six weeks some of the sphincter action is regained

The pyloric portion of stomach is now grasped between thumb and index finger An incision is made 1 inch in length from the pyloric ring back upon the pyloric antrum This first incision goes through the muscularis down to the mucosa (Fig 492 1) A scalpel is now placed between the mucosa and muscularis in order to free the mucosa from the muscularis (Fig 492 2) A second incision is made at right angles to the first going through the pyloric ring down to the mucosa (Fig 492 3) A small

Fig 492—1 The pyloric portion of stomach is grasped between thumb and index finger An incision 1 inch in length is then made through the muscularis down to the mucosa extending from the pyloric ring on to the

away Fig cut away leaving the bulging mucosa

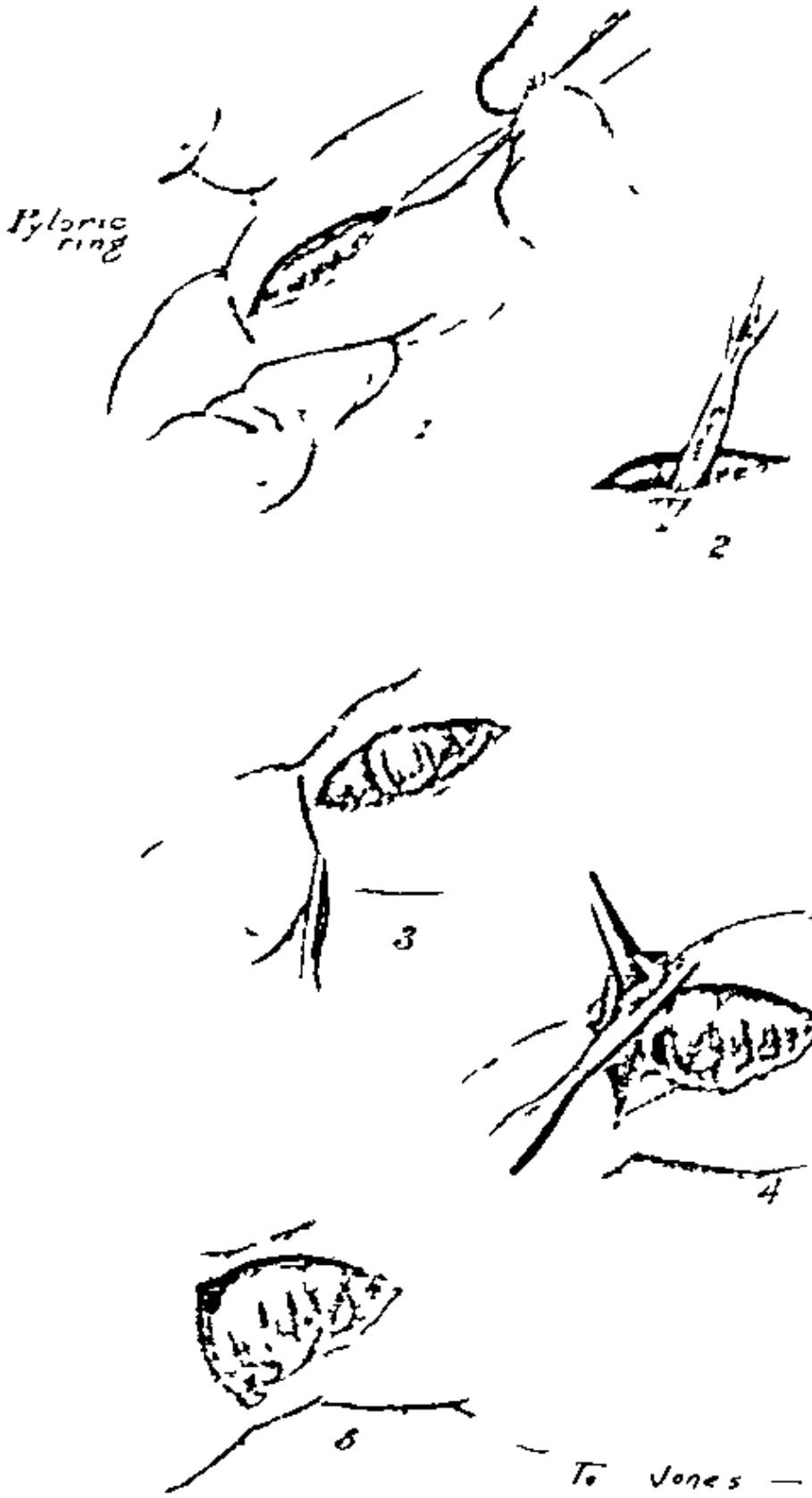

Fig 492

EXCISION OF DUODENAL ULCER: PYLOROPLASTY

Summary Surgical treatment of duodenal ulcers value of pyloric occlusion technic of operation for permanent occlusion by submucous fascial transplant technic of excision of duodenal ulcer and repair of defect

THE second patient for operation this morning is a man twenty six years of age who is suffering from a bleeding duodenal ulcer He has been under medical treatment on two different occasions The first treatment was three years ago At that time he was confined to the hospital for six weeks on starvation treatment and all the careful routine that goes with the medical management of duodenal ulcer One evening six months after the first treatment he suddenly became faint and very pale and an hour afterward vomited blood It was very evident from the history and from the record of the medical attendant that he was suffering a severe acute hemorrhage from his duodenal ulcer He was given careful medical treatment and made a good recovery

A few days ago he entered the hospital on account of extreme paleness and severe cramp like pains in his abdomen He states that his stools were black during the last week and that he felt nauseated at various times His hemoglobin is now down to 25 and fluoroscopic examination reveals a typical defective cap just beyond the pyloric ring in the first portion of the duodenum There is no questioning that this man is having a slow hemorrhage from his duodenal ulcer

In 1912 I did some experimental work on animals with the object of devising some operation for duodenal ulcer I demonstrated that by closing off the pylorus by a submucous fascial transplant taken from the fascia lata of the thigh we could produce permanent pyloric closure The procedure which is described in the Journal of the American Medical Association October 31 1914 is briefly as follows

triangular portion (Fig 492 4) of the free edge of the pyloric ring muscle is now cut away, leaving a triangular window of mucosa (Fig 492 5), and the entire area both ulcer (Fig 493 4) and pyloroplasty (Fig 493 *B*), is covered by the free edge of the omentum

Fig 493.—*A* Ulcer on lesser curvature *B* pyloroplasty covered by free edge of omentum

I consider the bringing over of the free edge of the omentum one of the most important and vital portions of the operation I showed six years ago in my experimental work on dogs that the omentum not only prevents leakage and hemorrhage but establishes a new blood supply and collateral circulation to the transplant and that portion of the stomach

way possible to apply a similar technic for duodenal ulcers wherever it is possible to accomplish it I believe that all duodenal ulcers that are in the first portion and anterior wall of the duodenum can be excised and a plastic performed on the pylorus without gastro enterostomy This procedure gives better results than closure and gastro enterostomy but I do not believe it wise to try and excise ulcers in the second portion of the duodenum or those located on the posterior wall When they are in these localities I prefer to do a permanent pyloric closure by a fascial transplant and gastro enterostomy In bleeding ulcer like we have here this morning I perform an operation the technic of which I will demonstrate to you Although I have performed this operation only four times it has been very successful in each attempt

Before performing the operation this morning I will transfuse the patient with 1 quart of blood by the Percy paraffin tube method I like this method of transfusion where I have two adults with large veins and believe it to be very practical I believe that all patients who are emaciated from dieting and inanition and have a fairly low hemoglobin should be transfused before operation I think it does the patient much more good to be transfused before operation and prevent shock than to try and transfuse him after operation in the hope of relieving shock

I now make a midline incision from the ensiform cartilage to the umbilicus When I open the abdomen the stomach and bowel appear very pale The stomach and pylorus are perfectly free Just beyond the pyloric ring on the anterior wall of the duodenum we find a markedly indurated ulcer about the size of a quarter I will now excise this ulcer and do a plastic on the pylorus by making a tongue-shaped flap which is pulled over into the defect made by excision of the ulcer

Grasping the pylorus between the thumb and index finger I make an incision through the muscularis down to the mucosa around the ulcer carry it through the pyloric ring and then in the shape of a tongue into the pyloric antrum (Fig 494 1) A scalpel is now placed between the *mucosa and muscularis* and several strokes along the line of this incision free the mucosa

An incision 1 inch in length is made from the pyloric ring back upon the pyloric antrum through the muscularis down to the mucosa Two strokes with the scalpel on each side between the mucosa and muscularis free the mucosa sufficiently so that the thumb can be placed under the pylorus grasping the edge of the muscularis The entire muscularis can be everted so that the mucosa lies on the everted muscularis like a rubber tube It can now be easily separated with a sharp scalpel from the muscularis A free fascial transplant from the fascia lata is now sutured around the mucosa forming a tight cuff The mucosa is dropped back and the muscularis is closed

I have practised this procedure combined with gastro-enterostomy in every case of duodenal ulcer operated in the last six years with splendid results Patients operated on by this method are free from pain and the usual symptoms of hyper acidity Practically all are placed on a full diet within two to three weeks after operation without any medication or alkalies.

There is certainly a great difference between the clinical course of patients following pyloric closure as compared with patients who have a simple gastro-enterostomy This can be easily explained by the fact that this simple closure which only takes about ten minutes has the following effect It prevents food and hydrochloric acid passing over the ulcer and all peri staltic waves in the duodenum are interrupted from the point of closure around to the gastro-enterostomy opening Now these three important results that the closure accomplishes are exactly what the medical man tries to do in the medical treatment of ulcer but he can only carry out these important steps relatively and for a short time For instance by starving his patient he prevents food from passing through the pylorus by giving alkalies in large quantities he prevents hydrochloric acid passing over the ulcer and by giving atropin he relieves the pylorospasm and hyperperistalsis This can only be carried out for a certain length of time while this permanent closure accomplishes these three important points for all time

In the last two years I have been so impressed with the good results of excision of gastric ulcers that I have tried in every

from the muscularis so as to allow the mucosa to balloon out (Fig 494, 2) By means of fine-pointed scissors I now cut away the ulcer (Fig 494, 2) On cutting away the ulcer we notice that the duodenum is full of dark clots of blood The mucosa of the tongue shaped flap of the pylorus is now brought forward into the defect and sutured separately with a Connell stitch (Fig 494, 4) The muscularis is now sutured separately with continuous over and-over sutures The free edge of the attached omentum is brought over the operated area (Fig 494, 4) You will notice that the pyloric ring has been destroyed on its anterior portion but it is wider and more roomy than before, and we are rid of the bleeding ulcer

The four patients that I have operated on by this method are absolutely free from symptoms, and fluoroscopic examination reveals that the stomach empties in from one and one half to two hours I believe this is due to the fact that the pyloric ring has been destroyed to such an extent that the sphincter action of the pylorus has been lost to a great degree, and all signs of pylorospasm, of course are absent

You will also note that it only took us about twenty to twenty five minutes to perform this operation I am convinced it is very simple and very efficient

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Fig 494.—1 The pyloric portion of the stomach is grasped between thumb and index finger A circular incision is made around the ulcer through the muscularis down to the mucosa This is carried through the pyloric ring

a Connell stitch 4 the muscularis is now sutured separately with a continuous over and-over suture *Note* The suture line is later covered by the free edge of the attached omentum which is not illustrated in the drawing

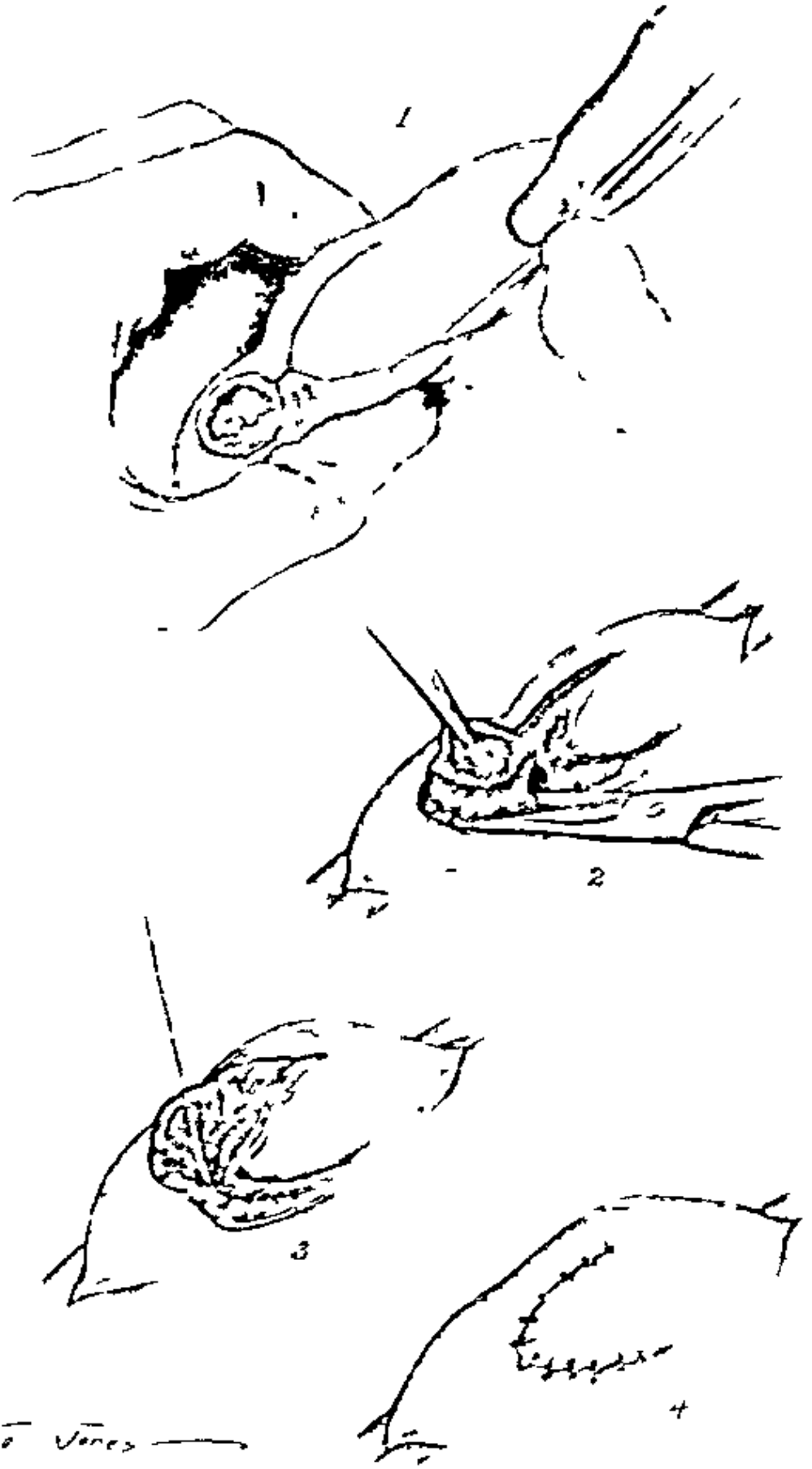

Fig 4.4

CLINIC OF DR CARL BECK

NORTH CHICAGO HOSPITAL

OLD SINUS FROM HIP DISEASE TREATED BY SKIN SLIDING

Summary Persistent sinus following resection of head of femur for tuberculosis eighteen years ago cure accomplished by epidermization of tract technic of operation

MISS Y, thirty two years old, was operated on when she was fourteen years old for tubercular coxitis The operation was, as far as the removal of the tuberculous process was concerned, an excellent success, having been done by one of the best surgeons in those days Nicholas Senn The head of the femur was removed and the acetabulum cleaned out, the stump of the upper portion of the femur has, in the course of years, gradually adapted itself and formed a new head, but with restricted motion The unfortunate thing about the case is that during all these long years she has never been rid of a postoperative fistula, which has kept on secreting a seropurulent discharge and has had no tendency to heal permanently At times it would apparently heal under the influence of bismuth injections and remain closed for a time, only to break open again, with the usual symptoms of retention, consisting of fever, slight chill, and general ill feeling until the abscess broke Her physician in the East sends her to us to see if we may not be more successful with the bismuth treatment than he has been or to try some other newer method

The general examination of this young lady shows that she is very healthy in every other respect The right leg is very much shorter than the left, probably $2\frac{1}{2}$ to 3 inches, the motion in the hip is very much restricted only excursion to a very slight degree is possible, and she does not walk except with a crutch

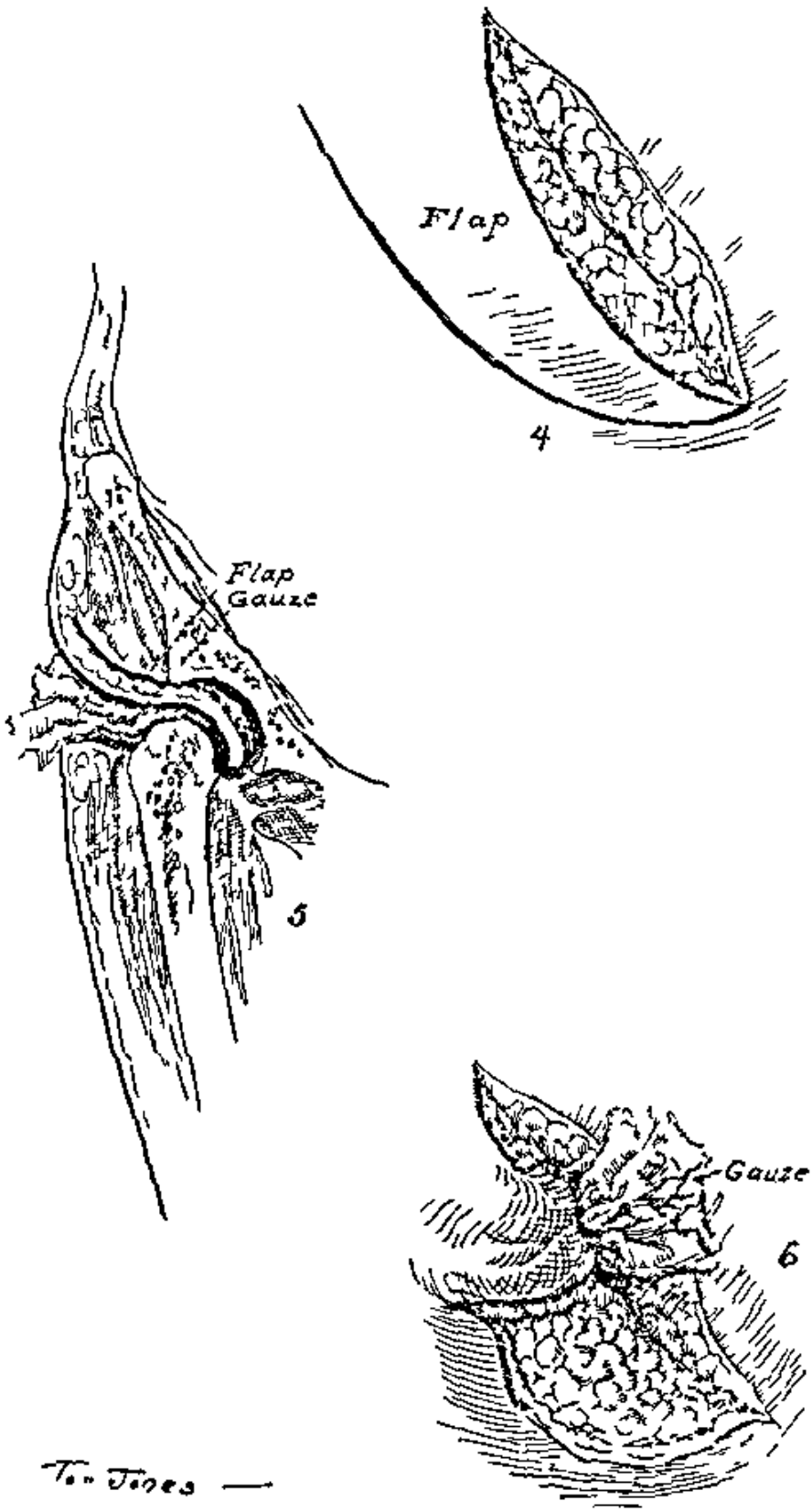

Fig 496.—4 Skin flap outlined 5 6 skin flap in place secured by gauze pack

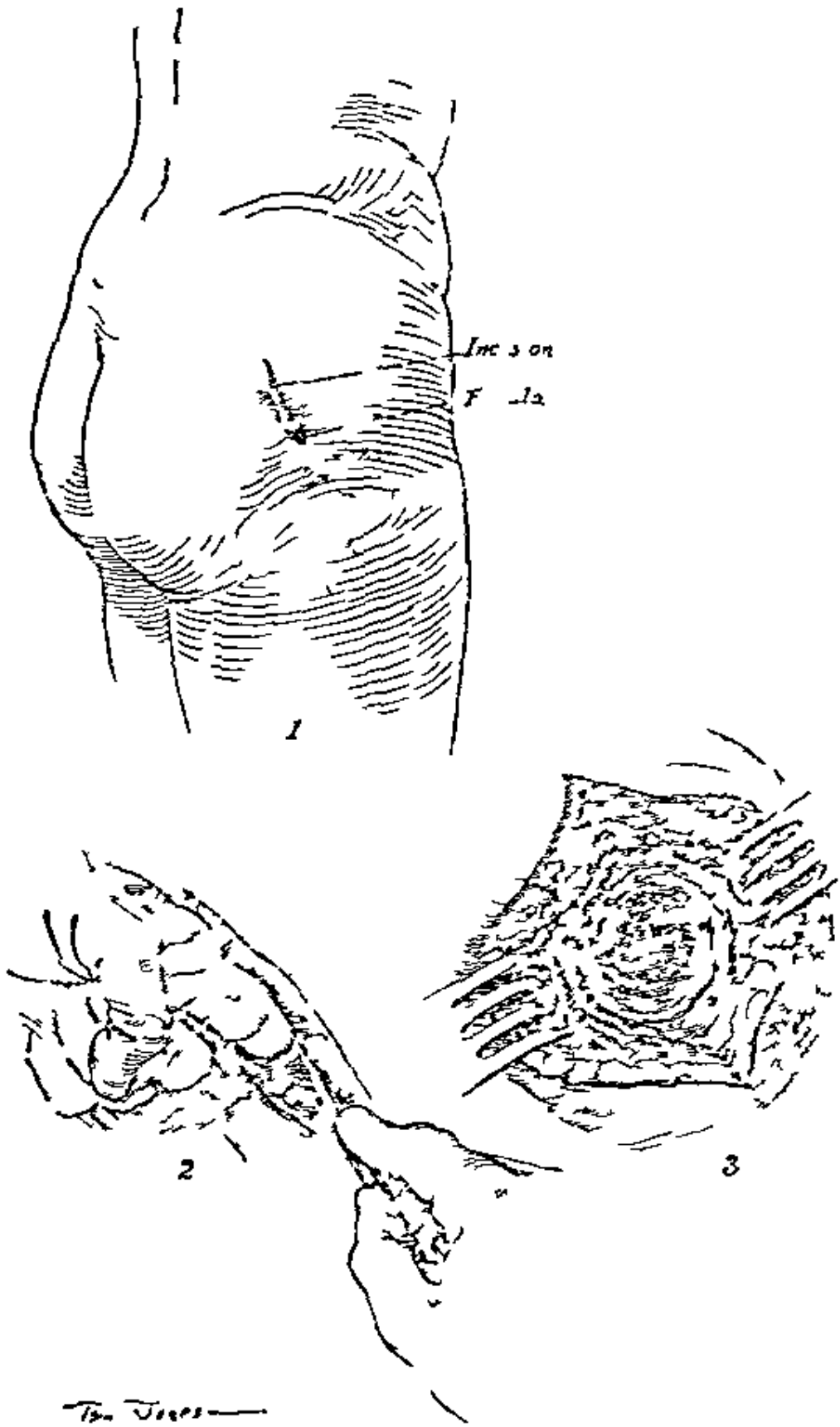

Fig 495.—1 Orifice of sinus dotted line indicates line of incision 2 incision being made with the finger as a guide 3 funnel-shaped crater ready for skin flap

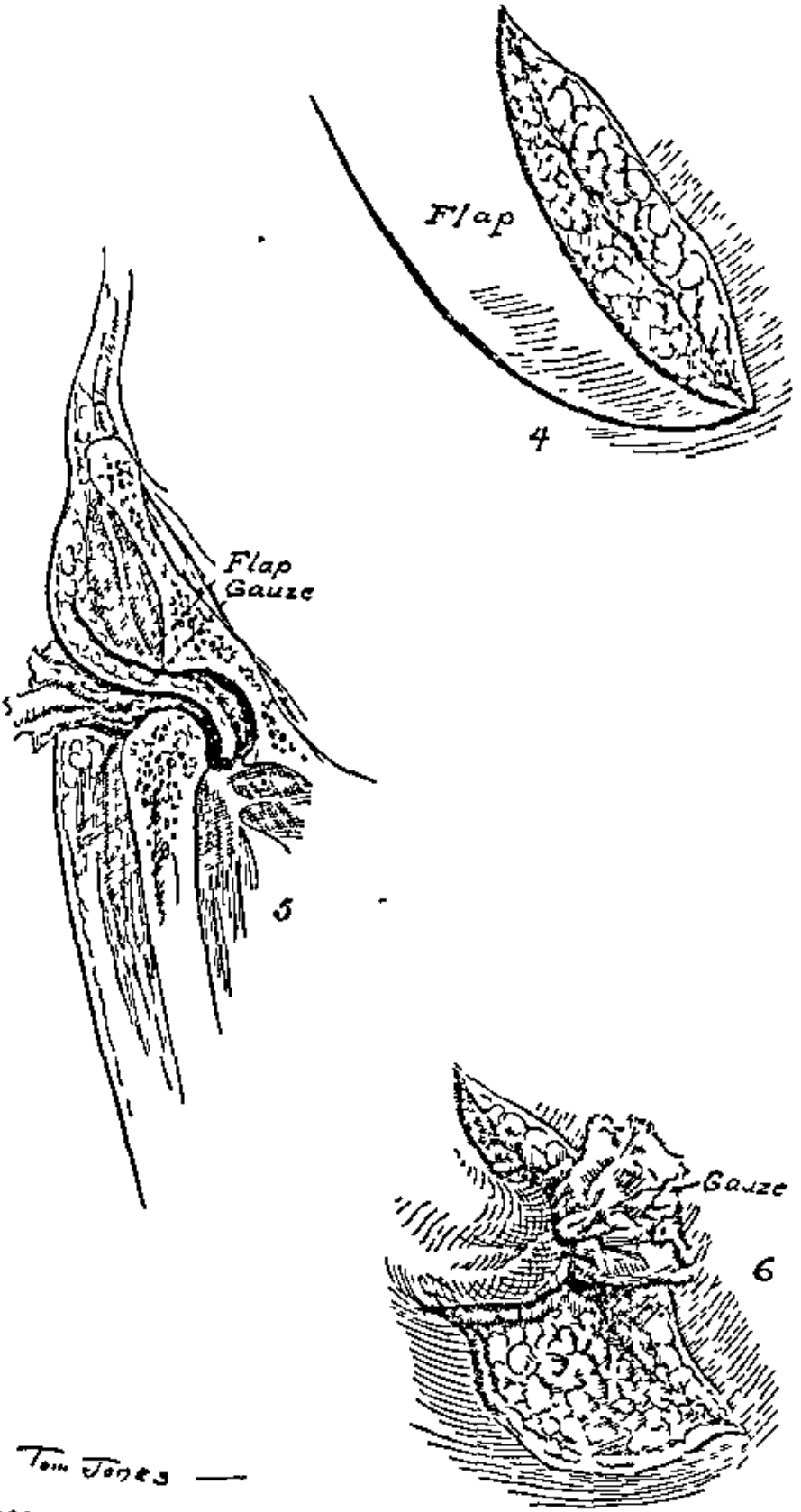

Fig 496.—4, Skin-flap outlined, 5, 6, skin-flap in place, secured by gauze pack.

On the outer aspect of the hip in the center of a scar is a small fistula from which a seropurulent discharge of moderate quantity oozes in twenty four hours Another small fistula is at a slight distance from the first one but at this time no discharge comes from it.

An *x* ray picture shows that the fistula leads to a cavity of small size on the inner surface of a somewhat irregular femur Since so many attempts have been made with the bismuth paste and always a fistula returned I think it is advisable to transform the cavity into one lined with skin through the method of a sliding skin flap

We introduce a sound into the fistula and cut in the direction of the old scar wide enough to allow the introduction of our finger, which allows us to examine the condition on the inside, the wound is then enlarged with the knife under the direction of the finger cutting away from the finger toward the femur (Fig 495 2) Retractors are inserted to open the cavity and we inspect it so as to see whether any tubercular conditions are present Only granulations of a harmless nature evidently non tubercular fill the cavity They are scraped away and the cavity transformed into an open funnel-shaped crater (Fig 495 3) A tongue-shaped flap is then cut on the outside with a broad pedicle (Fig 496 4) and this skin is introduced with its tip into the depth held there by pressing some gauze into No cavity (Fig 496 5 6) and an ordinary bandage applied the suture of any kind is inserted and the whole crater is allowed to heal by secondary union and cicatrization making frequent use of adhesive plaster dressing which rapidly allows epidermization.

Note—This patient left the hospital four weeks later completely cured with no discharge from the hip walking on a solid leg with the aid of a cane

DIVERTICULUM OF URINARY BLADDER IN AN INGUINAL HERNIA

Summary Operation on an irreducible hernia—discovery of a pantaloon sac lying side by side with a diverticulum of the bladder treatment

This patient a lady of forty five, has observed a tumor mass in the right inguinal region for some time The tumor is painful and largest in size while she is standing when on her back it is considerably smaller but does not disappear entirely The tumor feels irregular and is in certain ways connected with the skin so that it cannot be pushed entirely back Some portions of it seem to be harder than others On coughing it is propelled outward but not to a great extent We find that we have to deal here with an inguinal hernia which is not entirely reducible The only peculiar feature about it is that it is so irregular in shape and so much more toward the median line than we commonly see hernias In every other respect the lady is well Considering the pain the tumor causes her at times and the possibility of incarceration we have decided on operation

On dissecting the hernial sac we have a great deal of difficulty in locating the sac of the hernia because of the considerable amount of preperitoneal fat present We find that the irregular shape was due to some indurated preperitoneal fat and a few lobules of adherent omentum within the sac which we have finally dissected It is one of those so called pantaloon sacs or bifurcated sacs (Fig 497 1) on further examination of this sac it seems to us that toward the median line there is another sac like a hernia coming through a small crevice in the abdominal fascia (Fig 497 2) This sac seems rather thick and has no preperitoneal fat but its neck fills out the crevice in the fascia very tightly and does not allow any pulling forward nor pushing backward The thickness of the wall makes us suspicious of the bladder but as it has a real neck it must therefore be if a part of the bladder a diverticulum of the same Considering this

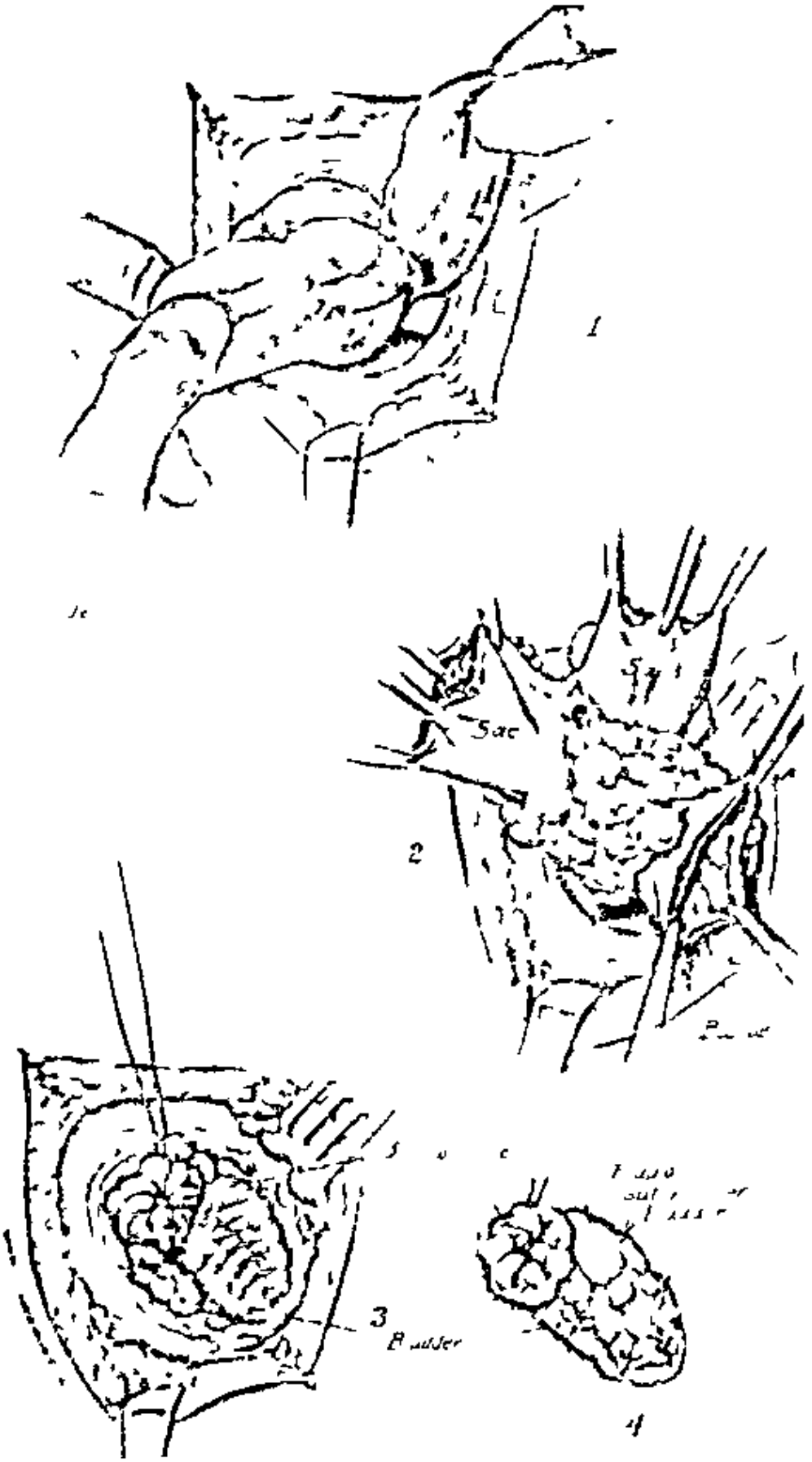

Fig 497

probability, we incise it, introduce a catheter, and find that it really is a diverticulum of the bladder The sac of the hernia is now ligated, cut off and secured in the usual manner, the diverticulum is cut off at its neck and sutured by a continuous suture which does not pass into the mucous membrane, but keeps the thread in the muscularis (Fig 497, 3) After the suture has been completed a lobule of fat from the preperitoneal space is sutured over it to secure better continence of the suture (Fig 497, 4) The wound is then closed with a silkworm gut drain in view of the possibility of a urinary fistula

Note—An intra urethral catheter (A'demeure) was left in place for eight days and the urine drawn off constantly After the removal of the catheter the patient passed urine spontaneously every four to five hours About fifteen days after the operation an abscess formed at the outer angle of the wound, a little bundle of catgut was discharged and with it a stream of urine came for a few hours, whereupon we again introduced a catheter This was left in the bladder for a few days, whereupon permanent closure of the fistula ensued

GANGRENOUS HERNIA OF THE BLADDER AND INTESTINE

Summary A patient sixty three years of age, with a large postoperative ventral hernia repeatedly incarcerated and finally becoming strangulated with gangrene and sloughing of the overlying tissues operative technic postoperative course

This old gentleman, sixty three years of age, has been a sufferer from a large hernia for the past nine years Many years before that he was troubled with bladder symptoms, and finally an operation was performed in a small town in Ohio for an enormous stone in the bladder The stone measured $6\frac{1}{2}$ inches in circumference and filled almost the entire bladder A large breach in the bladder had been necessary and evidently a per ineal section and urethrotomy had to be made at the same time The patient made a very tedious and slow recovery after many months At times it seemed as though he were breathing his last, but he finally recovered The opening in the bladder closed and opened many times but ultimately healed, leaving a large ventral hernia the size of a child s head, containing omen tum loops of intestine, and the bladder with the scar of the same attached to the scar of the abdominal wall During the years that followed he suffered many times from urinary obstruction during which it was necessary to use catheters Many false passages were made, but he recovered from every one Following the advice of his last surgeon, he objected to any kind of operative interference in later years, even when the hernia became temporarily incarcerated and gave him a great deal of pain He finally became addicted to the use of morphin and thus he went on until the present time He finally came under the observation of Dr McG , who strongly advised a radical operation seeing that the man's general condition was good and that there was a possibility of curing him He could not convince the patient of this and operation was refused

A few days ago he was seized with violent pains in the hernia, and notwithstanding all careful methods the contents of the hernia could not be brought back into the abdominal cavity and it was evident that the patient was suffering from acute strangulation of the hernial contents Applications of moist warm dressings did not improve the condition and on the second day it was evident that some important change had taken place in the hernia A blister formed on the surface the tumor of the hernia began to darken in color and within a few hours it was evident that gangrene of the most acute character had set in. From the gangrenous mass was running an ammoniac foul smelling fluid and the omentum black red in color and exuding disintegrating fat, appeared on the surface In this condition I saw him at his home in consultation with Dr McG His pulse was regular, strong and about 80 per minute His features were drawn and he showed a slight stupor though he could answer reasonably all questions He suffered considerable pain although under the influence of a narcotic. The abdomen was not particularly distended but one could see the peristaltic movements of the bowel through the wall of the abdomen His bowels had not moved for two days He belched but did not vomit The tumor itself the size of a small child s head showed superficial gangrene for about two-thirds of its circumference The skin adjoining the gangrene was somewhat red and edematous from acute inflammation From the gangrenous mass was running urinous foul-smelling fluid (Fig 498) We were sure that the *bladder had become gangrenous also and that the urine* had begun to infiltrate the tissues of the hernia One could distinctly outline and percuss intestinal coils in the hernia

The prognosis under the present condition is absolutely fatal within a very short time Operative prognosis is poor, but there is some chance of recovery Of course the procedure depends entirely upon the nature of the tissues and the contents of the hernial sac. Sepsis is almost sure to occur nevertheless it is worth while to undertake an operation We told the patient his chances, he agreed to the operation and was transferred to the hospital. It is now two hours since I first saw him

Operation —The hernial sac is walled off by gauze and towels, so that during the operation the fluid will not flow into the field of operation and we can operate as much as possible within a clean area We open the sac through a transverse incision above the gangrenous area and carry our incision around so as to enter the sac freely We first meet with omentum The free fluid within the sac has somewhat of a urinary odor, but not as bad as on the outside It is carefully mopped out with salt water The omentum is then divided between ligatures close to

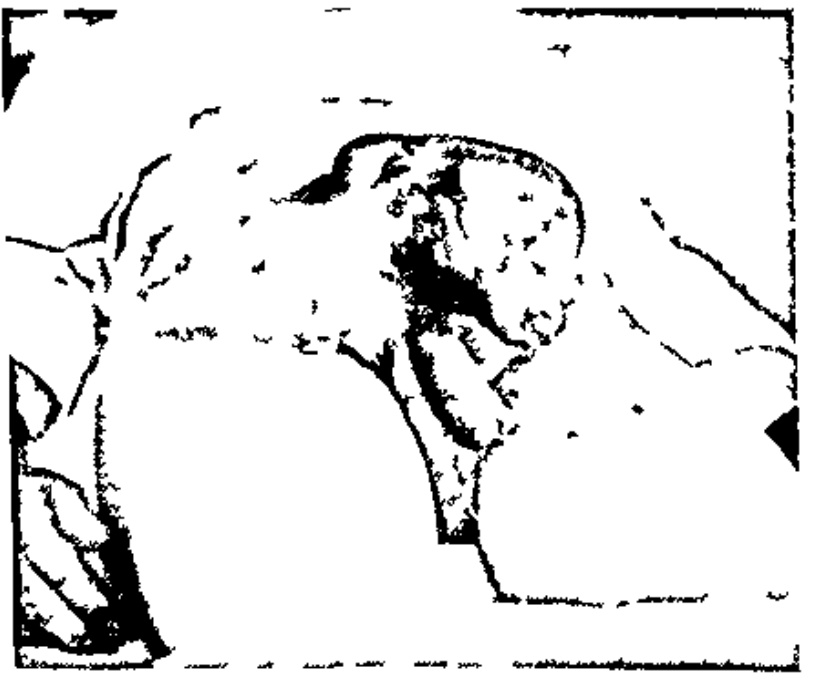

Fig 498 —Just before operation note extensive infiltration and edema of tissue surrounding the tumor

the ring of the hernia We now find that there are three loops of intestine in the sac With some difficulty they are pulled out from the sac their surface is covered with a fibrinous mass which can to a certain degree be peeled off but not entirely—not enough to separate the bowel and make it free The third loop of bowel belongs to the large intestine and has a dark spot which seems more dead than alive Nevertheless it is not interfered with and we trust that it will revive After returning the omentum and the three loops of intestine into the abdominal cavity we find that we have in the lower portion

of the sac the entire bladder with two distinct gangrenous ulcers of white color, through which urine trickles in the posterior wall One ulcer is very near to the posterior lower surface and the other is higher up The apex of the bladder forming the apex of the hernial sac is altogether gangrenous or semigangrenous

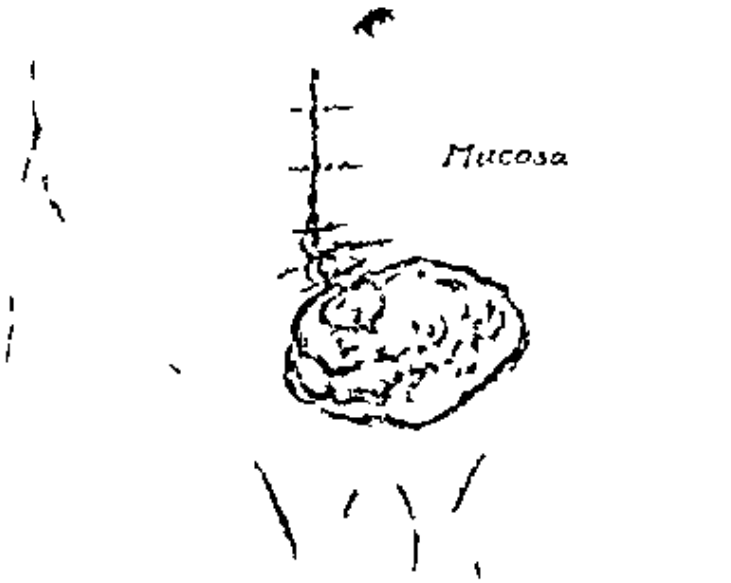

Fig 499 —Two weeks after operation the bladder still outside the body the urine discharging through a large fistula

Considering this condition I think it advisable to leave the bladder outside the peritoneal cavity and I therefore pass my first suture for closing the abdominal cavity through the peritoneum posterior to the bladder wall below the gangrenous por

tion to the other side of the peritoneum I slip a long tube with gauze underneath this first ligature into the culdesac The rest of the abdominal incision is then easily sutured Thus the gangrenous portion of the bladder, as much as has not been cut away with the sac, remains extraperitoneal We place the patient in bed in fairly good condition A catheter is introduced into the bladder and suction is made so as to prevent the urine from flowing into the abdominal cavity until adhesions and a protecting wall have formed

Postoperative Notes—Contrary to all fears and expectations, the patient made a very good recovery Shortly after operation his temperature fell from 100° F to normal, his pulse remained near normal all the time He did not vomit at all and the gangrene showed no tendency to spread He had no signs of peritonitis, not even of peritoneal irritation

Two weeks after operation Most of the urine comes from above and keeps him saturated most of the time (Fig 499)

Note—Since the preceding note was made the bladder has sloughed off at the level of the skin the patient urinates normally, and his fistula is healed

CLINIC OF DR JOHN R HARGER

COOK COUNTY HOSPITAL

ACUTE HYPERPLASIA OF THYROID WITH DYSPNEA

Summary A patient twelve years of age complaining of marked dyspnea on exertion associated with rapid enlargement of the thyroid gland diagnosis dangers of palliative treatment technic of operation under local anesthesia Presentation of autopsy report with demonstration of organs from a neglected case

THE case today is one of unusual interest, first because of its extreme severity, and second, because of its rarity

History —The patient is a girl twelve years old, who enters the hospital with the complaint that about three months ago she noticed a swelling on the front of her neck, which has increased in size quite rapidly For the past five or six weeks it has been tender to touch and has interfered with breathing On several occasions she has had choking spells, especially after exertion, and now she is afraid to run or climb stairs for fear she will choke She makes no other complaint sleeps well, eats well and is otherwise free from distress Her sister informs us that she has not yet menstruated, but we note considerable development of the mammary glands

Past history is entirely negative as to anything that might influence the present condition

Family History —The mother of the patient has had a goiter of moderate size for several years, and a sister of fourteen has had a small goiter since birth

Examination —You can see a moderate enlargement in the region of the thyroid gland It is fairly uniform a little larger on the right side comparatively soft, and moves with the trachea during deglutition When I produce pressure on the lateral lobes toward the midline the patient immediately shows

signs of distress in breathing especially is this true of inspiration and when I press with my thumb on the anterior surface of the mass breathing is perfectly free Those of you who are close enough will notice that when the patient is entirely undisturbed she has a slight inspiratory wheeze These findings indicate that the lateral lobes of this thyroid are producing sufficient pressure upon the trachea to cause it to collapse laterally and thus interfere with respiration

This mass does not extend down behind the sternum but can be raised entirely above it and pressure on the anterior surface tends to relieve dyspnea rather than increase it

There is no tremor exophthalmos or tachycardia The pulse is now 80 respirations 20 and temperature 98 2° F The heart and lungs reveal no abnormalities

Diagnosis —The diagnosis here seems quite clear and we are forced to conclude that we are dealing with an acute hyperplasia of the thyroid gland and that the surrounding tissues of the neck have not been able to accommodate themselves to this new condition and thus undue pressure on the trachea is produced The tracheal rings in a child of this age are very soft and offer but slight resistance to this sudden increase in pressure and therefore collapse That the trachea has collapsed laterally is evidenced by the immediate increase in dyspnea when pressure is exerted over the lateral lobes

Prognosis —Some of you have already considered the prognosis in this case and the question of treatment enters into it at once I want you to see that the prognosis here is very grave unless this patient can be kept under strict supervision day and night or be operated on now and given relief from this distressing condition It is in just this type of case that the patient may be awakened in the middle of the night by sudden closing of the trachea Extreme dyspnea and cyanosis appear immediately and death is imminent for when this acute stage arrives unless immediate relief by tracheotomy is at hand the patient must succumb

Treatment.—The patient has been under the supervision of a skilled pediatrician for the past four weeks and yet her con

dition has gradually become more alarming therefore I feel that immediate operation is indicated

Anesthetic —The question of an anesthetic is a very important one here and every precaution must be taken to guard against a possible increase in the dyspnea We already have a very small passageway in this trachea and a prospect of its being distorted and pressed upon during the operative procedure faces us if we dare risk the dangers of a general anesthetic We could pass a catheter into the trachea and introduce the anesthetic through it but I do not believe that is indicated for I feel confident that I can remove all the gland that is necessary under local anesthesia

Operation —As the patient is only twelve years old and of medium size I have given her only $\frac{1}{8}$ grain of morphin before coming to the operating room I will now block off the thyroid region by using a 1 per cent solution of apothesine A $\frac{1}{2}$ to 1 per cent solution without adrenalin will do the work and I therefore refrain from using anything stronger It is not essential to inject the solution intradermally nor does it require injection into the deep tissues of the neck All that I will do is to infiltrate the subcutaneous tissues thoroughly well back from the field of operation which in most instances will so block the nerve supply to the part that all sensation both superficial and deep will be entirely cut off I usually have 3 or 4 ounces of the solution prepared and then use it *ad libitum*

I will now inject a line from the angle of the jaw (Fig 500) downward across the sternomastoid to a point near the middle of the clavicle The other side I will treat in the same way and then connect these two lines by injecting along the under surface of the jaw and the upper margin of the clavicles

I will now make the usual incision extending in a semicircular direction about 1 inch above the clavicle and allow it to extend well toward each lateral margin of the gland By dividing and retracting the overlying tissues I soon reach the capsule It will not be necessary to divide the muscles as you see they can be readily drawn aside The capsule is being removed with the overlying tissue so that I can use it to cover the cut surface of the gland that is allowed to remain I will now remove enough of

this gland to relieve the pressure. To remove a wedge-shaped piece from each lateral lobe would not be sufficient I am now removing practically the anterior half of the right lobe I will take with it the midlobe and about an equal amount of the left lobe. Please note that there is comparatively little hemorrhage It is apparent now that the pressure upon this child's trachea will be relieved to a great extent by the removal of so much of this gland, and we must not forget that the remaining portion will,

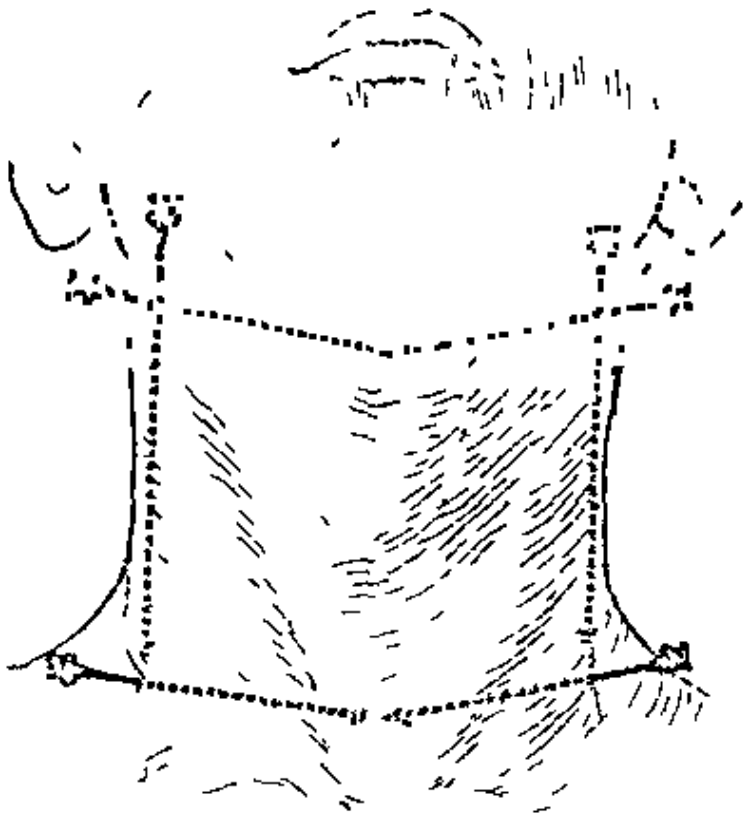

Fig 500 —Area of anesthesia produced by injecting anesthetic subcutaneously and well outside of the operative field

after the period of adolescence, undergo a certain amount of retrogressive change, and if we remove too much the patient will eventually manifest symptoms of hypothyroidism By removing the anterior half of each lobe we have avoided all danger to the recurrent laryngeal nerves and the parathyroids, and have not materially disturbed the blood-supply to the thyroid itself.

After tying a few of these bleeders I will cover the cut su face of the gland by closing the capsule and superficial tissue and insert a cigarette drain into the most dependent portion the wound

Now I want to call your attention to a few facts of especi interest in this case The child complained of pain when I fir began to inject the anesthetic, but when I explained to her wh I was doing and that if there was no more pain she should l quietly and keep still she quieted down immediately You n ticed that when I made the initial incision she complained whe the knife reached the extreme left end of the cut, but after th she never moved nor made complaint, and yet we proceeded wi the operation just the same as though the patient were in dee narcosis There was no disturbance with her breathing duri the operation and she is now able to smile at you, and I thi her condition is quite different from what it would have bee if a general anesthetic had been administered

Pathologic Report —Simple goiter showing rapid prolifer tion and increase in the follicular structures

After-treatment —The patient left the hospital the four day, at which time it was noted that she manifested a few sym toms of hyperthyroidism which were no doubt due to the i creased absorption from the cut surfaces of the gland The symptoms soon disappeared and the patient made a comple recovery and is now in excellent condition

Report of a Similar Case —If you will give me your attenti for a few moments longer I want to give you an abstract of similar case that was in part under my care only recently, a which because of delayed treatment ended disastrously

History —A boy aged fifteen entered this hospital compla ing of difficulty in swallowing and breathing and some pain the neck He states that he was perfectly well until two or thr weeks ago, when he caught a slight cold and had a mild cou Up to that time he had no difficulty with respiration or swallo ing At that time he noticed on awakening some pain in neck and he was unable to breathe as well as usual, the pain the neck was increased by swallowing Two days ago (N

vember 24, 1918) he noticed that his collar was too tight and there was some swelling of the lower part of his neck

Past and family histories were negative

Physical examination was entirely without interest except for the condition of his neck and throat There was a very moderate enlargement in the region of the thyroid gland the left lobe being especially palpable The mass was firm rather low in the neck, and moved with some pain, on swallowing

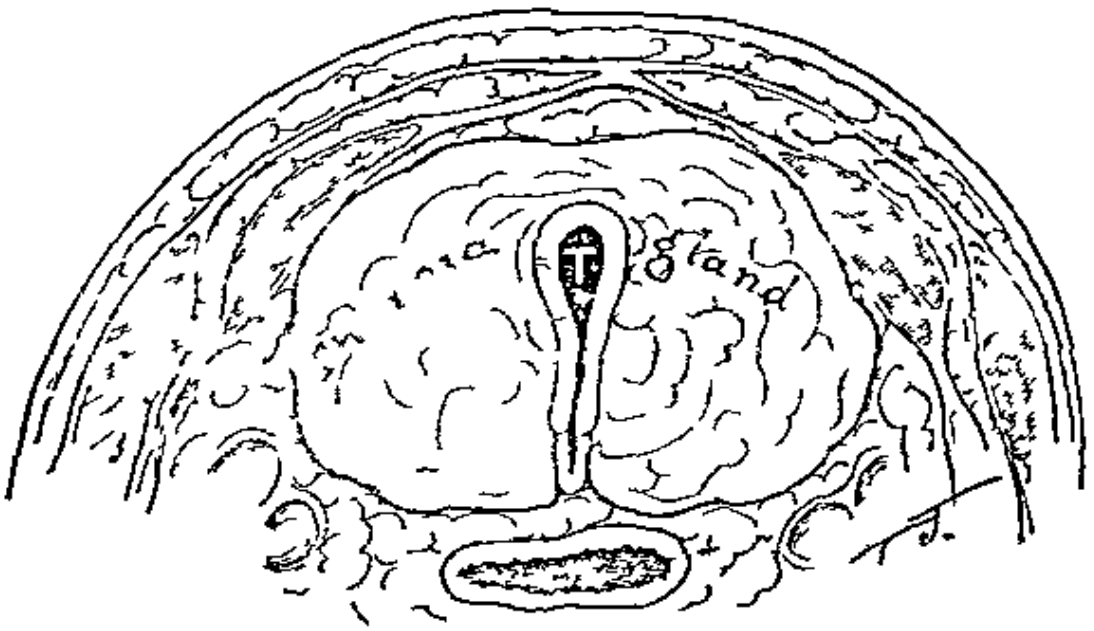

Fig 501 —The thyroid enlarged so rapidly that the surrounding tissues could not accommodate themselves to the rapid increase in pressure. The tense overlying fascia and muscles thus aided in the collapse of the trachea The breathing space was limited to the narrow tract (*T*) anteriorly

Subsequent History —The patient entered the hospital at 1 30 in the afternoon at which time his temperature was 99° F pulse 82 and respirations 20 He appeared uncomfortable and breathed with some difficulty During the early hours of the night about eight to ten hours after his entrance his breathing became more distressed This condition gradually grew worse until about 2 A M when morphin and hot inhalations not having given relief the house physician Dr Cushman attempted intubation Failing in this she attempted tracheotomy but because of the goiterous mass and the collapsed condition of the trachea this also failed About 3 30 A. M. I responded to a

call and found the patient in extreme dyspnea and very cyanotic I immediately made an incision in the neck just above the sternum and found the trachea collapsed laterally A large tube was inserted and the patient soon breathed with ease I then advised partial thryoidectomy under local anesthesia for the following day He then passed from my care and operation was refused him Three days later the tracheal tube was removed under ether anesthesia and a smaller one inserted, after which he developed bronchopneumonia and died

Postmortem examination disclosed marked diffuse hyper plasia of the thyroid gland, surgical tracheotomy, and lobular pneumonia

We have here the gross specimen of the thyroid gland with the trachea Please note when I hold this up that the lateral lobes are very large and firm and that they have caused the trachea to collapse laterally, so that there is no opening left except a small one near the anterior portion of the original canal where the tracheal rings succeed in maintaining slight separation (Fig 501)

CLINIC OF DR KELLOGG SPEED

Cook County Hospital

ELEPHANTIASIS NOSTRAS

Summary Presentation of patient with elephantiasis of the scrotum technic of removal of excess tissue and re establishment of lymph drainage clinical varieties of elephantiasis etiology of elephantiasis nostras—importance of streptococcic lymphangitis—pathologic anatomy—clinical symptoms and course

This patient a colored man is married forty years old and a porter by occupation He complains of swelling of the scrotum Beginning five years ago the patient suffered from suppurating adenitis in the right groin for which several drainage incisions were made Deep thickened scars resulted, and three years later following similar suppuration in the left groin and multiple incisions he developed small ulcers of the scrotum and infection of the scrotal tissues The penis and scrotum became greatly swollen and have continued to enlarge gradually reaching the present size (Figs 502 503)

Two years ago following sores on the glans and a urethral discharge stricture of the urethra developed for which external urethrotomy was performed at the front of the enlarged scrotum at the base of the penis Through this opening now passes about two thirds of the urine the rest coming via the meatus A year ago he had a blood examination made the result of which he does not know but he was given one injection in his arm of a medicine he thinks was 606

His past history except for the venereal disease mentioned is negative His wife from whom he has been separated for eight years is living and well as are also three children A general physical examination on admission to the hospital was negative except the genitalia and adjacent regions There was no

thickenings There were no ulcers on the scrotal skin surface An external urethrotomy opening existed at the base of the penis on the anterior scrotal margin where the penile tissues had been cut through The urethra was here patent only its superior wall remained the lower wall having flared out and been retracted by the skin The patient had no edema of the legs

Fig 503 —Elephantiasis of scrotum due to blocking of lymph channels by scar tissue subsequent to suppurative inguinal lymphadenitis

and feet or of the abdominal skin wall above the pubes The scrotal mass had become so large that the patient could not walk comfortably

After his admission he was put to rest in bed to determine how much of the scrotal swelling was edema resulting from position We found that after several days the mass decreased in

general adenopathy Urine and blood examination revealed nothing abnormal The Wassermann test was negative

The inner side of the groins and the inguinal areas where incisions had been made to drain the suppurating adenitis presented several deeply retracted thickened scars with a tendency to keloid formation These were mostly transverse to the long

Fig 502 —Elephantiasis of scrotum due to blocking of lymph channels by scar tissue subsequent to suppurative inguinal lymphadenitis

axis of the body The skin covering the penis was very thick slightly edematous and covered the glans so that it could not be retracted There was no balanitis or paraphimosis The scrotum was very large and heavy The skin was mottled with pinkish spots in the area between the thighs and toward the perineum Although it felt edematous it could not be pitted the surface being liberally spotted with wart like outgrowths or

any tissues As I go deeper we pass through this thickened epidermis and come to tissues of the dartos that are extremely edematous almost like soft gelatin This is the great increase of collagen which is characteristic of elephantiasis, and of which I shall speak again With no great difficulty I first isolate the right then the left, testicle, lying rather high up near the anterior portion of the scrotum The cords are separated for about 3 inches and the testicles can now be held up out of the way by gauze slings They are quite normal in size a little soft, their lymphatic drainage has not been interfered with it goes to the sacral and lumbar glands via the cord

The next step consists in cutting away an elliptic portion of this thick mass on each side of the long incision I must not cut away too much because this thick skin has no elasticity, and if my closing stitches are under too great tension they will slough through I cannot undermine this skin up toward the thighs because it is tough, adherent, and poorly nourished, and I must also leave flaps large enough to cover the testicles to form a new scrotum The edematous connective tissue beneath the skin is taken away with it I have now removed two large pieces one from each side, they weigh several pounds

In addition to the amputation I wish to provide new and additional drainage for the new scrotum, there is no doubt that the enlargement has been caused by a blocking of lymphatic channels leading from the skin to the inguinal glands This blocking has been caused by the multiple incisions to drain the suppuration of the inguinal glands contracting scars having formed, and also by the streptococcic inflammation of the scrotal tissues and lymphatics

To attempt to provide a path over which new lymphatic drainage can develop I shall pass braided silk strands about 12 inches long from the scrotal tissues up subcutaneously to the abdominal skin above the pubes Three such strands of silk are inserted on each side one by needle insertion close under the skin and the other two through the subcutaneous tissue into a tunnel made by a 12 inch forceps thrust upward Small abdominal incisions over the forceps ends allow me to pull the threads

size from one fourth to one third After waiting eighteen days I decided to attempt an investigation of his urethra to decide whether he was leaking any urine into the scrotal tissues On June 20th under ether anesthesia the urethra was sounded An anterior stricture between the urethrotomy opening and the bulb was found To pass this and get into the bladder I had to perform a perineal urethrotomy behind the large scrotum The prostatic portion of the urethra was normally patent An in lying catheter was placed in the bladder and an attempt was made to get the bladder in good condition by free drainage and tonic irrigation Seventeen days later the deep urethrotomy wound being closed a plastic on the old anterior opening was performed under local anesthesia It was hoped that a flap of penile skin could be turned over this opening after freshening the edges so that the lower wall of the urethra here open could be rebuilt and the flow of urine could be directed out through the normal penile meatus A new inlying catheter was left in place The penile skin was very tough and thick and although the flap covering lay in apposition to cut edges without tension it grad ually sloughed and had to be sacrificed So much for the nutri tion and health of this thickened skin

It was my desire to clo e this urethral opening before doing a resection of scrotal tissues to avoid the possible contamination of the large wound which would result from excision of this mass However after some further rest in bed and bladder irrigation the urine being quite clean I let the patient get up and we were able to teach him to urinate in a standing position so that he did not soil his scrotal skin

Today over two months since his admission I feel ready to perform an operation to reduce the size of the scrotal tissues Choosing the median raphe as a guide we will cut through this very heavy skin from within a short distance of the penile ba e down toward the perineum This entrance is chosen for two reasons We expect to find in the path of the raphe where the two scrotal halves have fused a minimum number of blood vessels As I go deeper this path will also be a guide to the testes which I must first find and isolate before cutting away

inflammation and connective tissue hyperplasia of the lymph vessels This occurs particularly after erys pelas (streptococcus infection)

(2) Elephantiasis of tropical regions (filarial elephantiasis)

(3) Elephantiasis like tumors composed of connective tissue which occur as congenital deformities in contrast with (1) and (2) which are acquired

The etiology of elephantiasis nostras has been the cause of considerable controversy in the literature Hastings[1] reviewed the discussions and concluded that it corresponded to the elephantiasis dura of Virchow He mentions Bryk [2] who reported 2 cases after erysipelatous abscesses and the monograph of Nieden (1882) who considered the cause of elephantiasis minutely believing that it depended on lymphangiectases following inflammation The lymph glands and vessels take part in the initial erysipelatous skin inflammation thrombosis of the lymph vessels results and blocking of the lymph glands accounts for the mechanical stasis of the lymph The superficial skin and adjacent tissues retain their metabolic waste products which cause irritation and lead to hyperplasia Virchow favored this order of lymph vessel obliteration but Werner took the stand that the lymph vessels were never blocked they simply became varicose and elephantiasis was secondary to that phenomenon

For clinical purposes we believe that elephantiasis nostras results from chronic or recurrent inflammations combined with lymph and blood vessel stasis It follows chronic skin conditions such as syphilitic inflammation simple ulceration eczema lupus erys pelatous lymphangitis (streptococcic inflammation) and phlebitis A contributing factor may be found in pressure from contracted scars and adhesions due to trauma Hence lymphatic elephantiasis is defined as chronic progressive enlargement of a portion of the body the result of hyperplasia of the connective tissue of the skin and subcutaneous tissues aided by hyperplasia of the lymph vessels and chronic edema of the affected area

The condition is not extremely uncommon in the labia of the

[1] Jou Amer Med Sc 1906 397
[2] Oesterre h Ze t f He lkunde 1869 469

down to the scrotal edge Along the course of these threads I expect to provide for the escape of lymph from the tissues of the new scrotum the drainage into the abdominal tissues following normal paths I could insert narrow rubber tubes here but they would surely disintegrate after due time even if they remained aseptic and it seems much better not to leave such large foreign bodies in the tissues

We are not dealing with elephantiasis caused by filaria but with one caused by lymphatic blocking by scar tissue based on a suppurating streptococcic inflammation This man has never been exposed to tropical filaria he has never been south of Washington D C

I am convinced that we see elephantiasis of this type frequently enough usually in a beginning stage often overlooked and passed on until radical surgical measures become indicated On that account it is worth while to consider the matter of lymphatic blocking and resulting hypertrophic conditions before we make incisions for inguinal or other abscesses Every skin incision should be carefully planned to avoid disagreeable results either from scar loss of skin sensation lymphatic blocking or severance of deeper nerves and blood vessels Within the last week I have seen a soldier returned from France who had a small piece of shrapnel in his cheek near the angle of the jaw A surgeon operating for removal of the metal had made an incision just in front of the parotid gland in a vertical axis and severed all the lower branches of the facial nerve on that side with resulting paralysis

Let us inquire somewhat into elephantiasis because this case is an example of the acquired type which is not filarial in cause. Hutchinson said that whatever causes obstructive inflammation of lymphatic vessels may produce elephantoid hypertrophy of any dependent part He also said There is no such disease as true elephantiasis as distinct from the forms which are false (Polyclinic London 1904 vii 22)

A simple classification was presented by Neisser and Jadassohn in 1901 which we can adopt

(1) Elephantiasis nostras—after venous stasis with purulent

lymphatics primarily The lymphatic effusions resulted in hy pertrophy of the subcutaneous tissues possibly extending to and involving the other soft tissues or even the bony structures

Elephantiasis *nostras* became better understood after Sa bouraud s work in 1893 He made cultures from the skin during the erysipelatous attacks affecting an elephantiasic extremity and obtained a pure culture of streptococcus whereas cultures taken between attacks were sterile Many observers have con sidered that a syphilitic infection was contributory to the strep tococcic inflammation McDonagh[1] reported one scrotal case and Adamson[2] and Shattuck[3] reported 3 patients who had elephantiasis the first one a leg which offered no cord like enlargement of the veins or lymphatics and had a negative Wassermann and filaria were absent the other 2 involved both scrotum and legs and had distinct erysipelatous attacks

Recently Elliott[4] has described a case of elephantiasis nostras occurring in a nineteen year-old girl who had an ulcer and erythematous attacks in her left arm following vaccination which confined her to the hospital for three months Over a year be fore she reported her left arm began to swell and became red and warm about 6 inches below the acromion with no traumatic cause and no pain The back of her hand became puffy and the skin became mottled and twice as thick as that on the right hand At the time of Elliott s report the skin was described as not fixed dusky red in color with wart like lesions on both surfaces of the hand and an incised wound yielded a lymph like material when squeezed Streptococci were found during the erythemal at tacks A biopsy of a piece of skin gave microscopic findings as follows The horny layer of the skin was twice as thick as normal the rete about normal There was no inter or intra cellular epidermal edema and the individual cells of the epi dermis were normal The papillæ were flattened and there was great increase of collagen in the corium extending deeply into

[1] Brit Jour Derm. 1912 225
[2] Ibid 1910 1611
[3] Boston Med and Surg Jour 1910 107
[4] Jour Cutan D s including Syph 1917 xxv 17 25

female Croom[1] cites an instance of labial elephantiasis following lymph blocking in the groin due to tuberculous glands Grieg[2] reported enlargement of the labia, the result of chronic edema from lymphatic blocking Because there were no telangiectases and no alteration in color he considered that there was no interference with venous circulation His patient a nullipara, forty three years old, suffered with spastic contractures due to cerebrospinal sclerosis, causing forcible approximation of the thighs There was no history of inflammation or infection of the labia, but the skin had the same distinctive nodular appearance as the patient shown you Kelley[3] reported a case of unilateral labial enlargement

In 1916 Walther[4] reported an elephantoid enlargement of the right leg of a patient resulting from cicatrices in the groin coupled with chronic lymphangitis He obtained great improvement by implanting a rubber tube deep in the tissues to help drain the lymph from the leg to the abdominal wall Thiery[5] also recorded such a leg condition in a man forty-six years of age, who had never left France nor had filariasis The patient suffered from varicose veins of the leg starting at fifteen years of age, and had numerous ulcers and eruptions which resulted in his right leg being twice the size of the left at the knee Amputation was performed and some time later the remaining leg began to show signs of elephantiasis

Busey,[6] in his series of articles on the lymphatics in 1876 discusses non parasitic elephantiasis The congenital forms which he believed were local and occurred most frequently in acephalic and other monsters were the results of congenital nutritional defects the preliminary changes taking place during intra uterine life and being aided later by some acquired factor such as local inflammation The acquired form he believed involved both the blood vessels and lymphatics, probably the

996.

CLINIC OF DR VERNON C DAVID

PRESBYTERIAN HOSPITAL

INCONTINENCE OF THE RECTAL SPHINCTER

Summary Incontinence of rectum resulting from improper postoperative management of a case of fistula in ano technic of repair of external sphincter

NINE months ago while in the army this patient who is twenty four years of age developed a large acute ischiorectal abscess on the left side which was drained Subsequently a fistula developed which was operated and the tract laid open into the rectum cutting the external sphincter muscle The wound was tightly packed with gauze and according to the patient s statement this packing was not removed for ten days The fistula eventually healed but a deep depression running into the rectum and impinging to some extent on the internal sphincter remained The divided halves of the external sphincter could be felt beneath the skin on each side of the scar Since the operation the patient has had practically no control of his bowel movements and he soils his clothes a number of times a day There is no history of lues gonorrhea or tuberculosis

On rectal examination a defect in which the index finger can be laid runs into the rectum from the left ischiorectal fossa On either side of this depression which represents the scar of the healed fistula can be felt small bunches under the skin which are the cut ends of the external sphincter muscle In attempting to voluntarily contract the sphincters these cut ends retract demonstrating that the purse string action of the muscle is lost On internal rectal examination the internal sphincter is intact but involved in scar tissue on the left quadrant There are no sinuses present

the subcutaneous fat areas. The arterial blood vessels showed great proliferation of their endothelium, the capillaries were obliterated by endarteritis, whereas the lymph-channels were dilated, but their walls were not thickened

The early symptoms of elephantiasis nostras may be described as recurring attacks of erythema, the initial attack of which is often severe, edema and lymphangitis accompanying the erythema After some days the skin inflammation subsides and the edema persists, hypertrophy of the subcutaneous connective tissue occurs in the meantime and thus elephantiasis is inaugurated Daniels[1] states that elephantiasis may follow single or multiple attacks of erythema, or there may be no associated erythema whatsoever Pressure-pain is the second most constant symptom and constitutional disturbance is often wanting

Elliott concluded that the streptococcus is the cause of elephantiasis nostras and that the primary pathologic changes are in the blood vessels rather than the lymphatics Lymphatic stasis is a secondary change and there results edema, great increase of collagen with some infiltration of small round cells and polymorphonuclear leukocytes The condition must be differentiated from scleroderma and leprosy

Whether the primary changes affect the blood vessels or lymphatics, we should be careful in drainage incisions not to cut off main lymphatic trunks to dependent portions of the body, and if erythematous inflammation in these parts occurs we should be on guard against a resulting elephantoid hypertrophy Hot dressings rest, and other local measures must be adopted in streptococcic infections If the hypertrophy has already developed, we can excise and offer some means for lymphatic drainage, such as threads or buried tubes, if the affected parts are important

[1] Brit Med Jour., 1908, 1359

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In considering this case attention should be drawn to the inadvisability of packing a newly operated fistulous tract tightly and in leaving the packing in place for a number of days This procedure mechanically separates the cut ends of the external

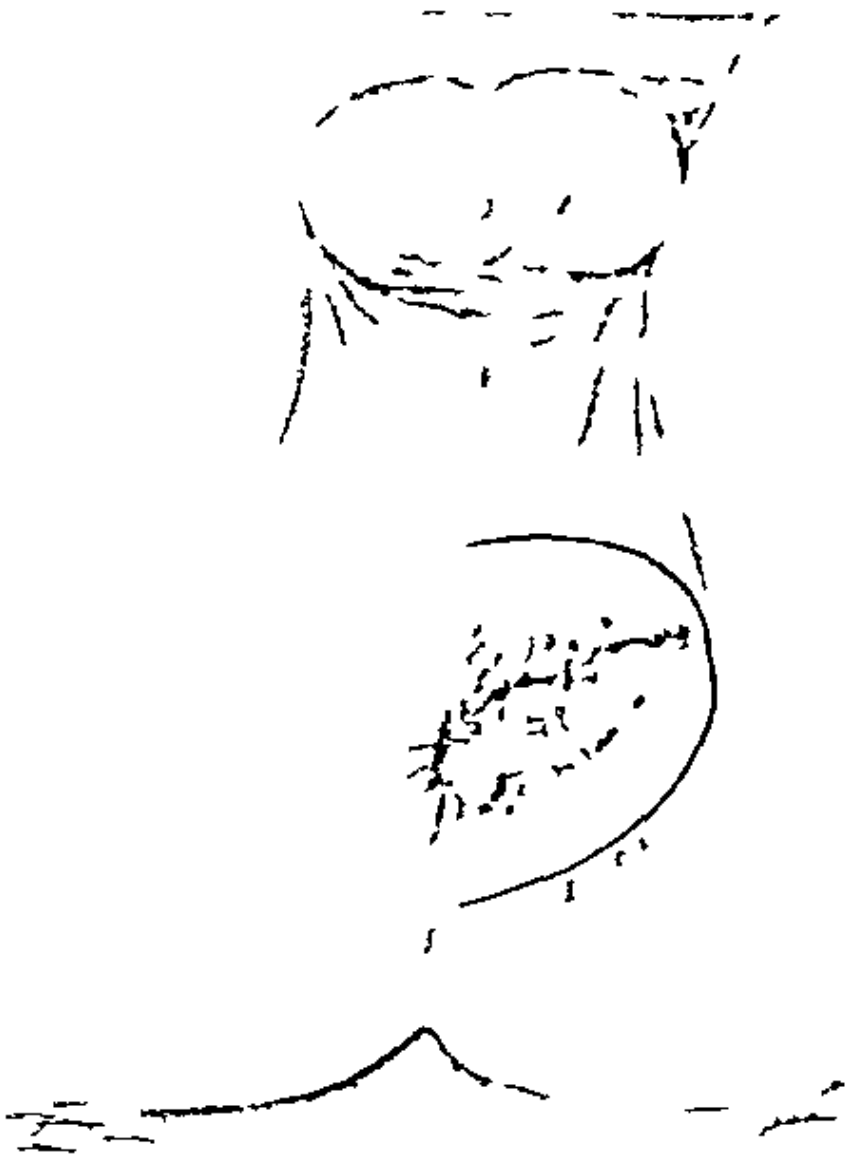

Fig 304 Deep scar at site of old fistula interrupting the continuity of the external sphincter muscle and destroying the function of the sphincter of the rectum Note line of incision carried to left of the anus

sphincter and maintained for a number of days makes a large defect in the soft parts which is replaced by a dense mass of scar tissue A single layer of vaselined gauze is sufficient packing to prevent adherence of the freshly cut tissues and if the wound

is dressed each day after the operation it is easy to keep the wound healing from the bottom by gentle separation of the soft

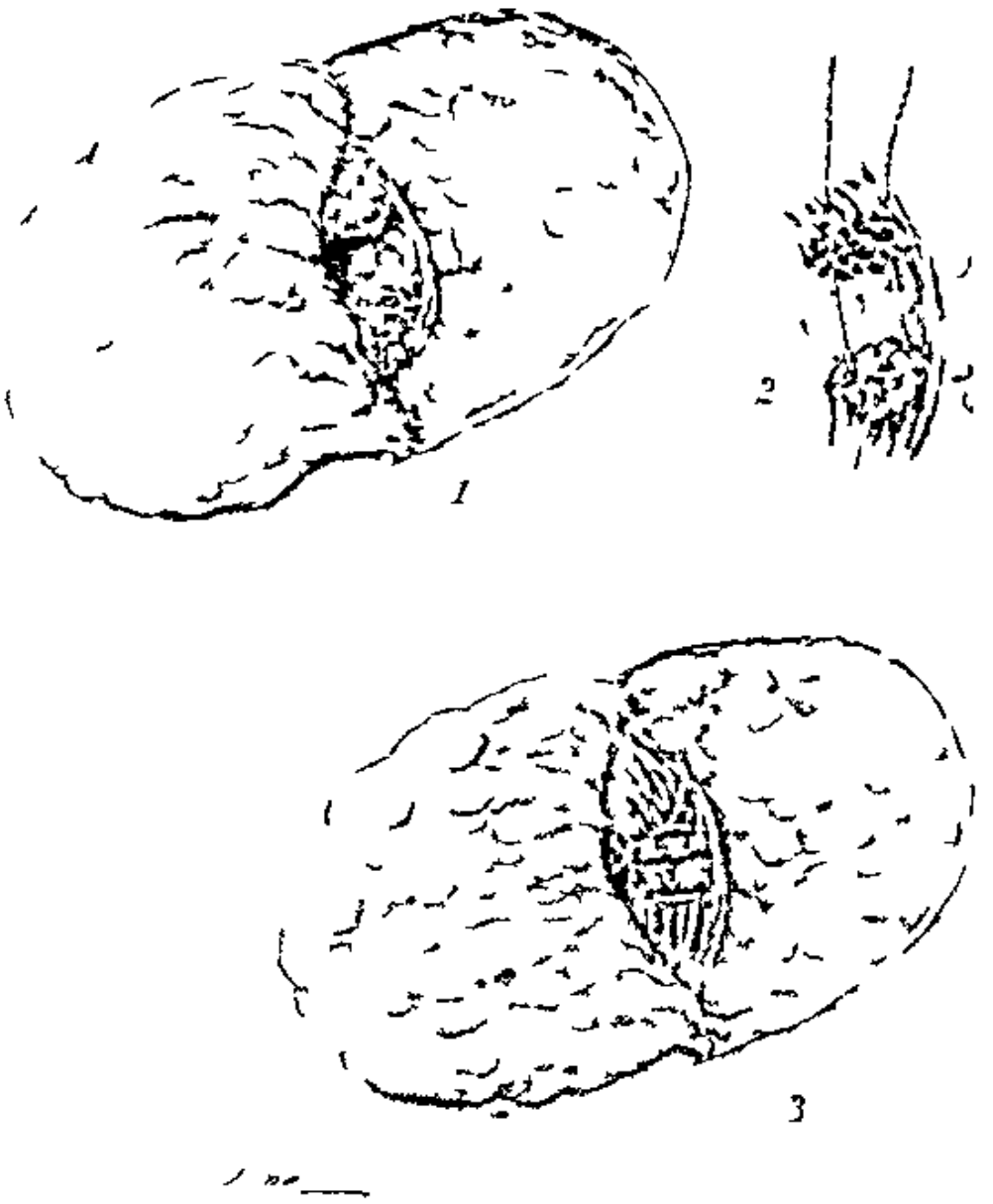

Fig. 503.—Flap turned down, cut ends of external sphincter muscle exposed and approximated by mattress sutures of chromic catgut

parts by a probe. When the fistula has healed the scar tissue is then linear and the sphincter muscle is able to contract and narrow the anal opening. Another feature of this case is the

presence of incontinence with an intact internal sphincter In the great majority of cases the internal opening of a fistula in ano is at the mucocutaneous junction which is between the internal and external sphincters Unless a large defect is made in the external sphincter the internal muscle is able to maintain continence In this patient a large defect filled with scar tissue as well as involvement of the internal sphincter by scar tissue is responsible for its failure to compensate for the lost action of the external muscle

Operation —Under local anesthesia a semicircular incision from the tip of the coccyx to the perineum is made keeping about 4 inches away from the anus (Fig 504) This incision gives ample exposure and is far enough away from the anus to prevent soiling of the wound during convalescence A flap is now turned up toward the anus until the fibers or cut ends of the external sphincter appear (Fig 505 1) The ends of the cut muscle are freshened and sewed together by interrupted mattress sutures of chromic gut (Fig 505 2 3) If it is desirable to decrease the circumference of the anus more than an end to end suture of the muscle accomplishes additional lateral sutures angulating the muscles may be put in The wound is closed with interrupted silkworm gut

The bowels will be confined for two or three days They will then be caused to move daily by the use of oil retention enemas to be given an hour before a bowel movement and the liberal administration of mineral oil by mouth

Postoperative Note —The wound healed by first intention and there was complete restoration of rectal continence

RECTOVAGINAL FISTULA

Summary Demonstration of fistula and technic of curative operation

THIS patient Mrs McK is forty two years of age One year ago she had an abscess in the posterior wall of the vagina following a fall against the edge of a bath tub This abscess was opened in the hospital and ever since the patient has had a discharge of gas and feces through a small opening on the posterior wall of the vagina She has had two operations for the repair of this fistula but in neither instance has there been a successful result There is no history of lues gonorrhea or tuberculosis and in every other respect the patient is in good health

On examination by rectum a small opening is found on the anterior wall at the mucocutaneous line which admits the tip of a small probe This probe can be passed into the vagina through an opening on the posterior wall about 1 inch behind the perineal body (Fig 506 1 2)

Operation—Using $\frac{1}{2}$ per cent novocain solution the sphincter muscle and posterior vaginal wall are anesthetized and a tubular dissection of the fistulous tract from the vaginal side down to the submucosa of the rectum is made (Fig 507 3) As the rectal opening is usually somewhat retracted due to scar tissue contraction it is well to mobilize the submucosa for a distance of $\frac{1}{2}$ inch around the rectal opening of the fistula This will prevent difficulty in turning the fistulous tract inside out into the rectum (Fig 507 4) A linen ligature is tied around the base of the fistulous tract which hangs loose in the rectum and the redundant portion of the tissue beyond the ligature cut off (Fig 507 5) The vaginal defect which is now in relatively healthy and uninfected tissue is closed by two or three layers of interrupted catgut stitches

Postoperative Note—The bowels were confined for three days At the end of this period the patient was allowed up and went

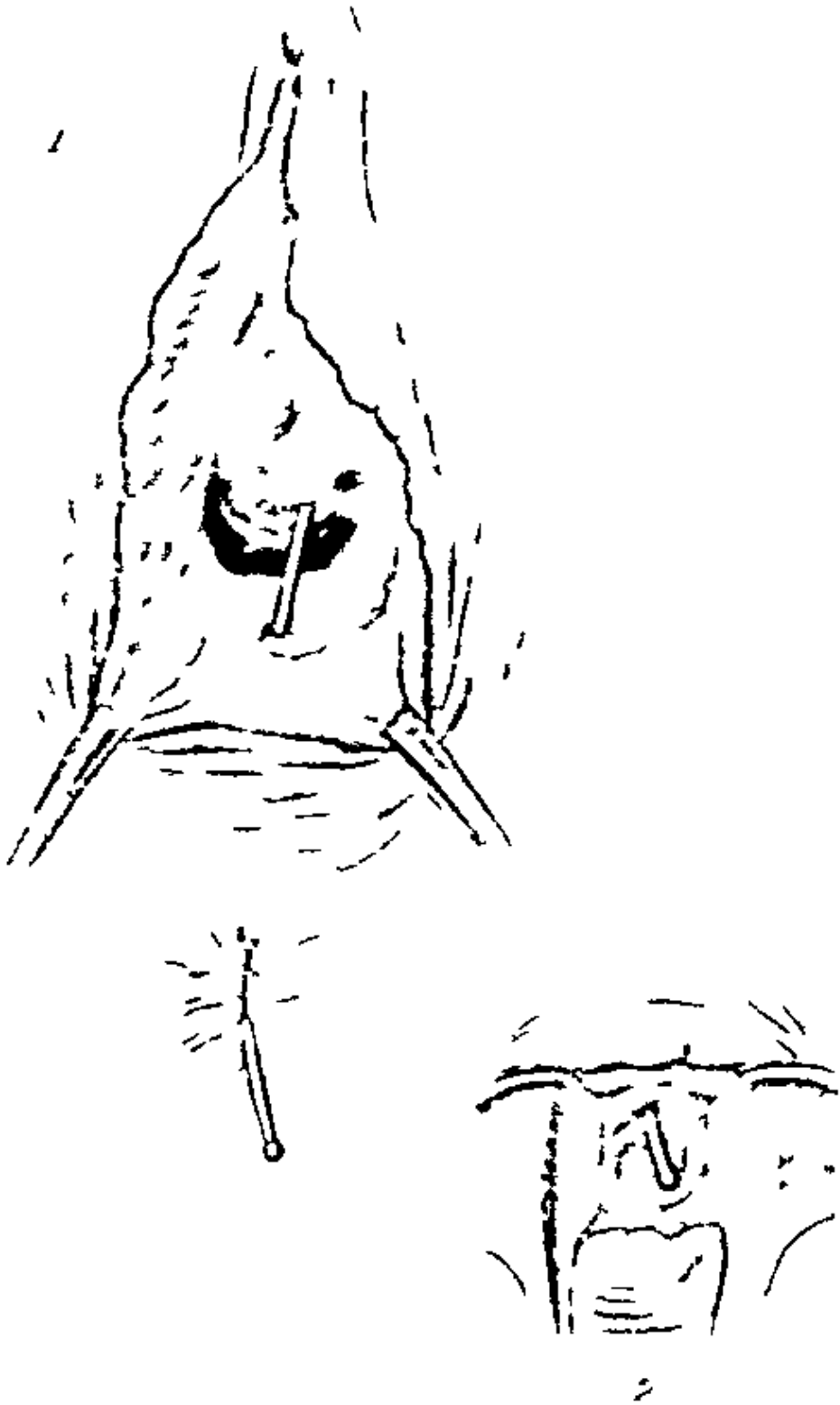

Fig. 506.—Probe along fistulous tract demonstrating vaginal and rectal openings

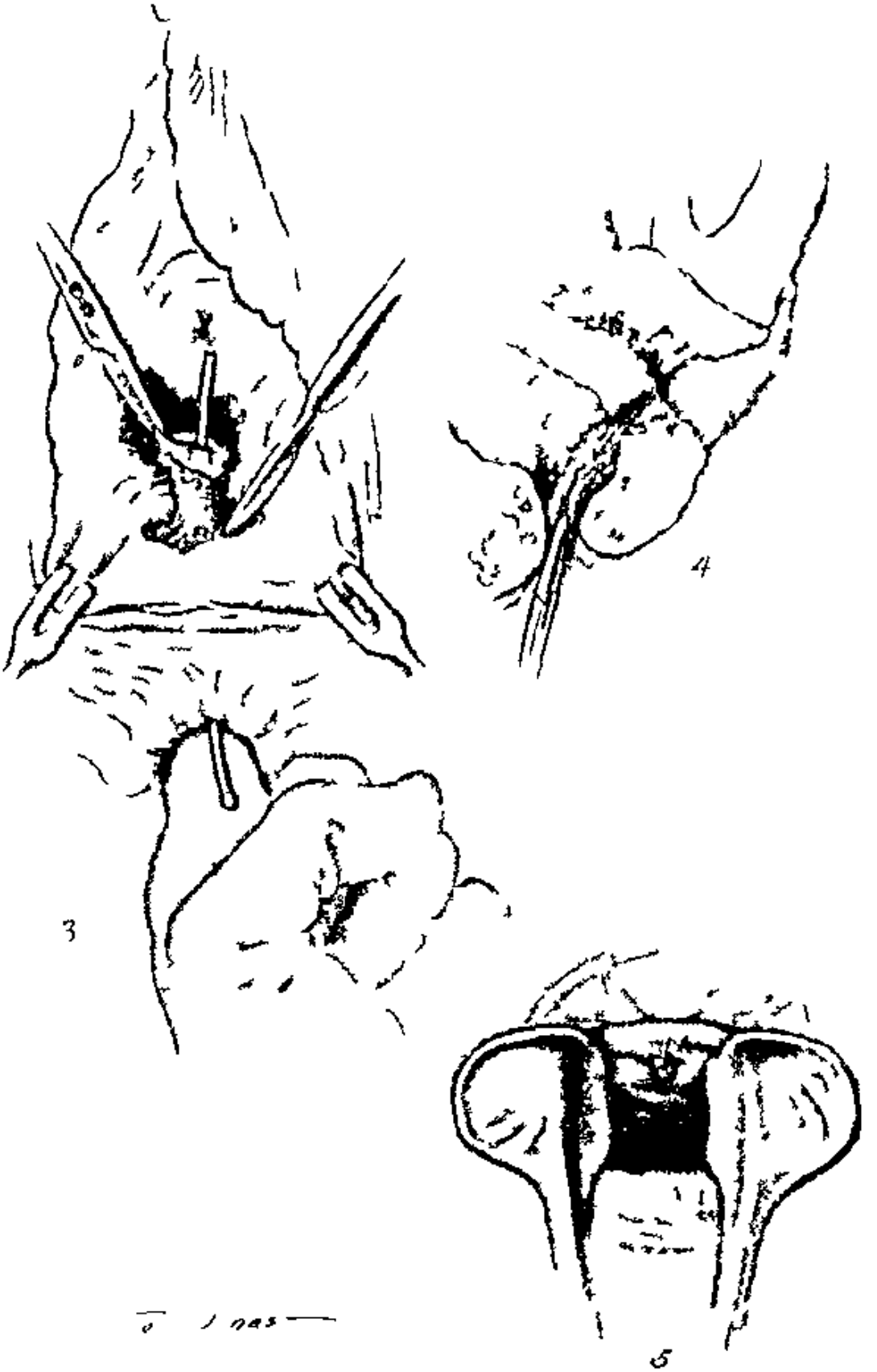

Fig 507 The infected tract is dissected out from the vaginal side down to the mucous membrane of the rectum (3) It is then inverted into the rectum 4 the base ligated and excess tissue cut off distal to the ligature (5)

home shortly afterward. Examination six months later disclosed little evidence of her former trouble.

The advantage of this operation is that the whole infected tract is dissected out and inverted into the rectum, which allows primary closure of the vaginal defect. No plastic operation dealing with fistulous tracts around the rectum, bladder or vagina is always successful, but I think the relative simplicity of this one, coupled with the good result obtained in this case, recommends it.

CLINIC OF DR GATEWOOD

PRESBYTERIAN HOSPITAL

LACERATED WOUND OF BUTTOCK

Summary A patient admitted for treatment two hours after receiving a severe lacerated wound of the left buttock principle of treatment of wounds during period of contamination technic and results in present case

THIS seems like a morning of emergency surgery This man has just been brought into the hospital from his place of work He is a tank builder, thirty three years old, and a Finn by birth He does not speak much English, but from his employer we learn that about two hours ago while helping load a motor truck, he slipped and was caught by some sort of a heavy drill This tool had a sharp point and tore through the clothing over the left buttock and into the flesh There was considerable bleeding and a first aid dressing was applied without making any attempt to sterilize the wound As we remove this dressing we find a ragged lacerated wound of the left buttock about 25 cm long, extending diagonally upward and outward There is still some oozing The wound is filled with blood clot which we will not remove until we are ready to repair the injury While this is civil surgery, we can apply some of the principles which the war has emphasized

This patient comes to us during the period of contamination, and in civil practice we should see almost all our wounds much short of the arbitrary eight hours usually allowed before the beginning of the period of infection We shall proceed, therefore, to cleanse thoroughly the skin surrounding the wound For this purpose we shall use tincture of green soap and water, *taking care not to slop the infected* water into the wound We shall now shave the entire adjacent area and cleanse again with

soap and water, and then follow with 70 per cent alcohol Benzine followed by iodin is an excellent method where time is a factor, but where we have sufficient time at our disposal I prefer the mechanical cleansing with soap and water before attempting any method of sterilization The blood-clot is now

Fig 508 —Debridement incis on at a distance from wound margins to in sure removal of contaminated t ssue without soiling operative wound

removed and I am swabbing out the wound surface with tincture of iodin. I find that there is a ragged wound extending deep into the gluteus maximus muscle and it is from this wound that the bleeding is occurring Fragments of overalls and dirt are ground into the muscle The patient is thoroughly anes-

thetized and I shall now proceed with debridement (Fig 508) As the patient is rather fat there will be no difficulty in obtaining closure, and I will keep well away from the wound I have now removed in one block all the torn muscle and about 2 cm of skin on either side of the wound (Fig 509, *a*) It is essential to obtain good hemostasis, as blood or serum will make a good culture-medium. The muscle is carefully closed by interrupted sutures of catgut, taking a good deal of care to obliterate all the dead space, and the skin and underlying fat sutured with interrupted silkworm gut and silk stitches (Fig 509, *b*) It is well to insert a small collapsible rubber drain at the lower end of the wound to take care of any further secretion There is no reason why primary union should not be obtained and this drain will probably be removed at the end of forty eight hours

There is nothing new about this method The great lesson the war taught was that the earlier a case was operated upon after injury, the lower the mortality Professor Depage in his address before the American Surgical Society, stated that during the war by early operation the mortality in abdominal cases had been reduced from 65 to 45 per cent He recommended in those cases in which there was a doubt about the wound remaining sterile that it be left open and handled by Dakin's solution secondary suture being done on the second third, or fourth day Whether one should use Dakin's solution or not in this type of case is still a much debated question, but the underlying surgical principles are the same always In a community such as this there is no reason why a man should not have the benefit of surgical care well within the period of contamination and primary closure should be the rule In case of suspected infection we must get efficient drainage whether we use Carrel Dakin or not I think that we can heartily agree with Major Bulkley who in summing up his experience with fractures of the femur, said, "If more attention were paid to the operative treatment, less would be heard of the chemical treatment of wounds"

As a matter of routine this patient is given a prophylactic dose of 1500 units of tetanus antitoxin while he is still asleep We have recently had a death from tetanus The patient had

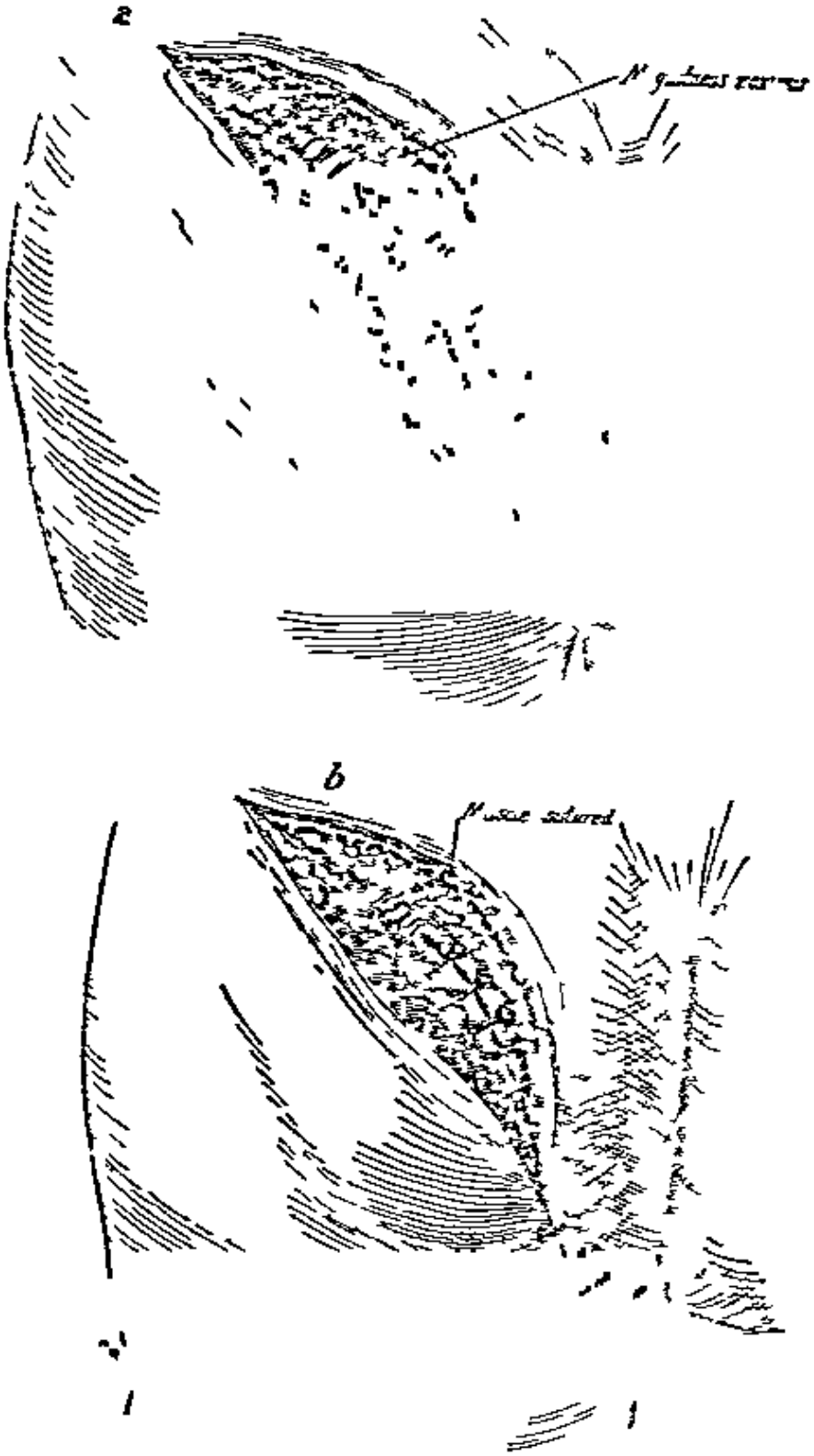

Fig 509.—*a*, Debridement completed wound ready for closure *b* closure of wound in layers by means of interrupted sutures, taking care to ensure complete coaptation of opposing raw surfaces.

been treated for five days at home for an injury of the hand There was a bad infection of the hand and arm when she entered the hospital No one thought of tetanus at this time, and no antitoxin was given Three or four days later she developed trismus and two days later she died

Fig 510 —Healing by primary intention appearance of wound at time of discharge from hospital ten days after operation

After-history —There was not the slightest drainage from the wound and the drain was removed at the end of thirty six hours The stitches were removed at the end of a week and the patient left the hospital at the end of ten days entirely well (Fig 510)

Fig 509—*a* Debridement completed wound ready for closure *b* closure of wound in layers by means of interrupted sutures taking care to ensure complete coaptation of opposing raw surfaces

CLINIC OF DR GOLDER McWHORTER

PRESBYTERIAN HOSPITAL

OSTEOMYELITIS WITH VARIATION IN GROWTH OF THE FEMUR FOLLOWING SEPARATION OF THE DISTAL EPIPHYSIS

Summary Presentation of patient discussion of the results of injury to epiphyseal cartilage—the experiments of Bidder and of Haas application of experimental results to conditions in case under discussion

THIS patient came into the hospital complaining of a chronic discharging sinus on the outside of the right leg just above the knee The patient is sixteen years of age Three years ago at the age of thirteen he received a traumatic dislocation of the lower epiphysis of the femur He was operated at that time in order to replace the epiphysis which was held in position by means of a Lane plate A sinus formed above the plate and two months later the plate was removed There has been a discharging sinus ever since Otherwise his history is negative

General Examination—The patient is a well nourished boy Examination is negative except for his right lower extremity

There is a small sinus on the lateral side of the thigh just over the condyle discharging pus This leads down to a cavity in the lateral condyle of the femur

The right leg appears shorter than the left smaller and there is a genu valgum deformity present On measuring the length of the two legs from the anterior superior spine to the medial malleolus the right is $1\frac{1}{4}$ inches shorter than the left By measuring from the spine to the adductor tubercle the shortening is found to be in the femur

The circumference of the right thigh 10 inches below the anterior superior spine is 1 inch less than that of the left The

CLINIC OF DR GOLDER McWHORTER

PRESBYTERIAN HOSPITAL

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circumference of the right knee is 1¼ inches greater than the normal left knee and that of the right calf is ¾ inch less than that of the left

When the patient is standing we can see an interesting deformity due to the disturbance in growth of the epiphyseal

Fig 511 —Note tilting of the pelvis and scoliosis due to the shorter right leg The left leg is straight genu valgum appears only on the right

cartilage This disturbance has not only resulted in shortening but in a more marked shortening on the outer side of the right femur which has produced a genu valgum Fig 511 The pelvis tips to the right with a compensatory scoliosis due to the shorter right leg When the knees are in contact the right foot is 4 inches from the left

The roentgenogram gives evidence of a cavity in the metaphysis of the lateral condyle (Fig 512) There is obliteration with ossification of the epiphyseal line on the lateral side (Fig

Fig 512 —x Ray photograph taken before operation there is a cavity in the metaphysis of the femur

513) There is some irregularity of the metaphysis (Fig 514) probably due to a fracture at the time of the separation of the epiphysis

I will describe briefly the operation for the cure of the osteomyelitis and the bottle-shaped cavity in the bone and then discuss the very interesting disturbance of growth which we have

Operation.—General anesthesia. The old scar is excised along the lateral side of the femur keeping above the joint line. The

Fig. 13.—X-Ray photograph made two month after operation. This shows the obliteration of the epiphyseal line on the lateral side of the femur and the overgrowth on the medial side. The wax form was left in place.

thickened periosteum reflected laterally and a small opening which leads into a large cavity in the bone is exposed. This cavity contains granulation and scar tissue. The opening is enlarged with a chisel and enough of the bone removed so that the

cavity is slightly wedge shaped with the base at the narrowest part The entire inner surface is chiseled and cureted Hemorrhage is controlled and sterilization attempted by application of 95 per cent phenol, followed by alcohol There are still a couple of oozing areas in the bone that I am controlling by means of Horsley s bone wax

Fig 514 —x Ray photograph made two months after operation lateral view There is marked irregularity of the metaphysis

I am filling the space in the bone with Mosetig Moorhof s iodoform wax filling This has been melted and cooled down to the consistency of butter The soft parts are sutured with interrupted silkworm gut stitches without drainage

This may heal up by primary union but probably there will be some discharge of the iodoform wax The use of the wax

makes it unnecessary to keep the cavity packed with gauze eliminates frequent dressings, and may result in primary healing The heel of his right shoe will be raised and that of his left lowered to partially compensate for the shortening of his leg

In contrast to this case I want to discuss a case I had in the clinic about a year ago This patient was a male about forty five years of age He came in complaining of symptoms resembling a sacro-iliac strain I examined him carefully and found the right leg to be $1\frac{1}{4}$ inches longer than the left This was due to an increased length of the tibia There was some enlargement and thickening of the tibia but no lateral deformity

He stated that at about twelve years of age he had had a severe bone abscess which involved the tibia and had broken by itself and finally healed He did not know of the increased length of this leg and had only developed symptoms within the last two or three months The osteomyelitis had evidently stimulated the upper epiphyseal cartilage plate of the tibia to increased activity

Discussion.—Bidder in 1872 performed a series of experiments upon animals to determine the influence of injuries to the epiphyseal cartilage plate upon the development of the bone He injured the epiphyseal cartilage plate by means of needles stuck into and by cutting through into that region When he injured the outer side of the epiphyseal cartilage the outer side of the bone remained shorter than the inner and the reverse was also true If the whole cartilage was injured there was an even hindrance of longitudinal growth The plate became degenerated and was replaced by connective tissue cells or bone trabeculæ which connected the diaphysis and epiphysis

There were more changes in the experiments where there was osteomyelitis present in addition to injury to the epiphyseal cartilage plate Bidder concluded that where physiologic activity was changed by stimulation or destruction there entered a disturbance of longitudinal development with characteristic deformity He believed that length depended upon the integrity of the epiphyseal cartilage when the cartilage became the site

of inflammation or necrosis synostosis of the bone segments might result

Ollier made the following conclusions

1 Insignificant incisions into the epiphyseal cartilage plate are without influence upon longitudinal growth

2 Marked lesions or excisions have a strong influence and cause shortening or collapse

3 Separation of the epiphysis is without influence if it is immediately replaced in good position

4 Full excision of the epiphyseal cartilage plate causes complete cessation of growth

Haab found that sticking pegs into the diaphysis caused a stimulation of growth because of the indirect stimulation of the epiphysis When the epiphysis was so treated there was a resulting shortening

Meisenbach found after experimentally stimulating the cartilage cells in some cases a wide epiphyseal line and increased compactness of diaphyseal bone He found that a stimulated epiphyseal line may be replaced by new bone He describes the epiphyseal cartilage plate as composed of (1) columnar cells of cartilage (2) proliferating cartilage cells (swollen cells of the diaphyseal line) (3) zone of calcified matrix

Haas states that the epiphysis separates from the metaphysis uniformly in the region of the large vesicular cells of the columns of cartilage

Haas has recently performed some interesting and very conclusive experiments with relation to the longitudinal growth of bone after injury to the epiphyseal cartilage plate and also upon the value of the blood supply in the region of the plate From his experiments he concluded that an adequate blood supply directly to the epiphysis is necessary for proper growth He found that when the blood vessels in the region of the plate are destroyed the loss of growth was greater than with destruction of the nutrient artery The loss of growth was in proportion to the injury to the blood supply Other factors of course may enter such as disturbances of the endocrine system, or stimulation or injury of this region by trauma or disease

Some of the experiments that Haas performed upon growing bones are very interesting, and I will give the general results in abstract He used chiefly the growing metacarpal or metatarsal bones of dogs

Group I Simple cross incisions through the epiphysis

1 A simple incision made through the epiphysis distal to the epiphyseal cartilage plate There resulted slight or no disturbance in growth

2 An incision through the epiphyseal cartilage plate (a) Direct incision through the cartilage without separating the surrounding tissues There resulted early ossification of the plate by changes in its center The greater injury made a proportionally greater disturbance in growth

(*b*) Incision through the periosteum with separation in the line of cleavage There always resulted a disturbance in growth Haas thinks it possible to make a separation without causing loss of growth. There resulted about the same disturbance by incising through the cartilage as from a separation in the line of cleavage

3 Incision through the metaphyseal region across the bone This healed as a fracture in the shaft without causing any disturbance in length

Group II Longitudinal incisions through the epiphyseal cartilage plate

1 Following a longitudinal incision through the epiphysis into the diaphysis there was no disturbance.

2 Following a longitudinal incision through the entire bone there was a definite disturbance The author thinks this due to a greater disturbance of blood supply

Group III Cross incision and raising and reimplanting the distal fragment

1 No disturbance when the incision was distal to the epiphyseal cartilage plate

2 Always a marked loss of growth resulted when the incision was made through the cartilage plate, but never complete cessation.

3 When the cross incision was made through the metaphysis there was complete cessation of growth in nearly every case

Group IV Longitudinal incisions with removal of one half of section

1 Where the incision extended from one end through the epiphysis up to the metaphysis there was only a very small amount of growth after the operation

2 Where the incision included the metaphysis the result was about the same as with previous experiment

3 Following the incision through the entire bone and removal of a longitudinal one half of bone there was practically complete cessation of growth

Group V Cross incision with removal of distal fragments

1 Following an incision across the epiphysis distal to the cartilage plate there was no disturbance

2 After the removal of the entire epiphysis up to the metaphysis there was almost complete failure of longitudinal growth

3 After removal of the metaphysis and epiphysis there was a pointed outgrowth from the diaphysis but less growth than normal

Group VI Cross incision with removal of the proximal segment

1 After an incision through the line of cleavage of the epiphyseal cartilage plate the segment was removed leaving the epiphysis with the cartilage plate There was practically complete cessation of growth

2 After an incision through the metaphysis and removal of the segment there resulted some growth but near the cartilage plate there was always considerable hindrance

Group VII Boring into and removing the cancellous bone of the epiphysis

1 There was no hindrance of growth following boring directly into the epiphysis

2 Following boring into the epiphysis through the epiphyseal cartilage plate there was decided hindrance of growth

Group VIII 1 After crushing the epiphyseal cartilage plate

and adjacent bone by a forceps there was early ossification with loss of growth in proportion to the injury

2 After cutting out a wedge from the region of the epiphyseal cartilage plate there was cessation of growth and ossification (Only a few experiments of this type were performed)

In the localization of the growing point on the epiphyseal cartilage plate Haas concluded from his experiments that the metaphyseal region plays little role in growth but acts only as a medium for growth but is also concerned in the ossification of the cartilage He believes that growth is due largely to the cartilage columns and adjacent cells in the epiphyseal cartilage plate

Haas studied the relation of the blood supply to the longitudinal growth of bone He found that the chief blood-supply to the epiphyseal line of the metatarsals comes from the plantar arteries These arteries after reaching the epiphyseal line encircle the bone, into which they send penetrating branches and anastomose with vessels on the dorsum The nutrient artery also enters on the plantar surface near the base of the bone

Haas found that there is practically no disturbance in growth after cutting the tissue and blood supply of the basal part of the bone but it is marked after destruction of the epiphyseal blood supply If both the nutrient artery and the epiphyseal arteries are injured there is a greater loss of growth than when only the ones to the epiphysis are injured Apparently the nutrient artery blood supply is not so important a factor in length producing as is the epiphyseal blood supply

These facts should be borne in mind when operating in the region of the growing epiphysis Disturbances may follow injury of the soft parts including the blood-supply to the epiphysis either by the original trauma or through operative interference without direct injury to the epiphyseal cartilage plate

Clinically we may see complete or partial arrest in bone growth after fractures in the region of the epiphyseal line through the epiphysis or metaphysis often associated perhaps with some separation. There may be increased growth near a diseased focus—tuberculosis and other forms of infectious processes

(Meisenbach MacAusland) apparently a result of the stimulating effect of adjacent inflammation

Hentschel reports a case of lateral bending in the tibia and fibula after acute osteomyelitis

Elmslie believes that a not infrequent talipes varus deformity may be due to the partial arrest of growth of the lower end of the tibia due to a longitudinal fracture through the narrowest part of the epiphysis accompanied by a partial separation of the inner part of the epiphysis This results in a scar across the new bone at the extremity of the diaphysis on its inner half with a resulting diminution or cessation of growth The outer part may continue its growth resulting in a varus deformity in this type of fracture and separation

Sir Robert Jones states that he has had many instances of separation of the epiphysis due to surgical operations in their vicinity without a subsequent difference in growth

There may have been a combination of several reasons for the disturbance of growth in this case We know there must be complete cessation of growth on the outer side of the femur as there is obliteration of the epiphyseal line and fusion of the epiphysis to the diaphysis It is possible that some growth may have occurred before this took place There is marked loss of growth on the medial side but it has not stopped growing with the other side as evidenced by the genu valgum Since the epiphyseal line is still present on the medial side there is little doubt that the deformity will increase The loss of growth is evidenced by the shortening and the deformity There is some broadening of the femur in the epiphyseal region as this is greater in circumference than the left one

The cause of the disturbance in growth may have been any one or a combination of the following

1 Injury to the blood supply to the epiphyseal line or injury to the surrounding soft parts at the time of the accident or of the operation

2 Injury to the epiphyseal cartilage plate at either time

3 Extensive fracture or crushing of the metaphysis with or without direct injury to the epiphyseal cartilage plate

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CLINIC OF DR BENJAMIN F DAVIS

PRESBYTERIAN HOSPITAL

FRACTURE DISLOCATION OF THE ASTRAGALUS

Sun n ary Late result of astragalectomy diagnos s of fracture d slocation of astragalus treatment—astragalectomy inadvisable as a rule mechan sm of fracture d slocation

IN a previous clinic we studied a case of fracture of both calcanei in which practically all the various causes of post traumatic disability occurring in such cases were demonstrable and we were given an opportunity to consider the best methods of managing fracture of the calcaneus with an eye to the removal of these causes of disability and the consequent restoration of the patient to an active life (Surgical Clinics of Chicago October 1919) Today we are fortunate in having another case of trauma of the tarsal bones to consider in comparison with the case we have already studied

The case is that of this young man who is now about thirty three years of age As you see him walk across the floor you observe that he limps slightly favoring the right foot and that there is a tendency for him to hold that foot in slight inversion and outward rotation (Fig 515) We remove the shoe and stocking and find that the normal arch of the dorsum of the foot has disappeared the dorsum is almost flat from before backward and the angle between it and the anterior surface of the tibia is but slightly greater than a right angle (Fig 516) The heel projects the malleoli are much lower than on the opposite foot, there is inversion a tendency to walk on the outer border of the foot (Fig 517) and the foot and leg are carried in outward rotation so that instead of the natural springy heel and toe gait of the normal foot the patient stumps along rolling his

4 Inflammation of the bone directly or indirectly traumatizing the growing columns of cartilage and causing early ossification

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CLINIC OF DR BENJAMIN F DAVIS

PRESBYTERIAN HOSPITAL

FRACTURE-DISLOCATION OF THE ASTRAGALUS

Summary Late result of astragalectomy diagnosis of fracture dislocation of astragalus treatment—astragalectomy inadvisable as a rule mechanism of fracture dislocation

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4. Inflammation of the bone directly or indirectly traumatizing the growing columns of cartilage and causing early ossification.

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Elm
Haa
1917
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police ambulance about fourteen months ago About two hours before, while he was driving a motorcycle and side car at the usual reckless speed with which such vehicles are driven, he was

Fig 517

Fig 516

Figs 516 517.—Patient standing with full weight on both feet Note that the right foot is inverted the dorsum is flattened and the internal malleolus is but half as far from the floor as the corresponding malleolus of the opposite ankle

side swiped by a motor truck our patient was pulled from under the wreck He was carried to a nearby drug store where a doctor tried unsuccessfully to reduce a *so-called* dislocation of the ankle and thence as stated to this hospital

weight diagonally from the outer side of the foot when it is placed on the ground to the inner side when the foot is raised A limited degree of motion is possible in all directions there are no points of tenderness although the patient complains of slight general soreness about the middle of the foot after a day s work There is a well healed operative scar about 4 inches in length curving from the leg on to the foot behind the internal malleolus It is evident that something is missing from the tarsus of this

Fig 513 Patient standing with full weight on both feet Note the inversion and outward rotation of the right foot

foot the calcaneus is obviously present the astragalus then must be the missing factor as it is the only bone whose isolated absence would permit the malleoli so nearly to approach the sole of the foot it also is largely responsible for the convexity of the dorsum of the foot at the ankle-joint in the normal foot which is absent here This is a case of fracture-dislocation of the astragalus with comminuted fracture of the internal malleolus treated by astragalectomy

The patient first entered this hospital on a stretcher from a

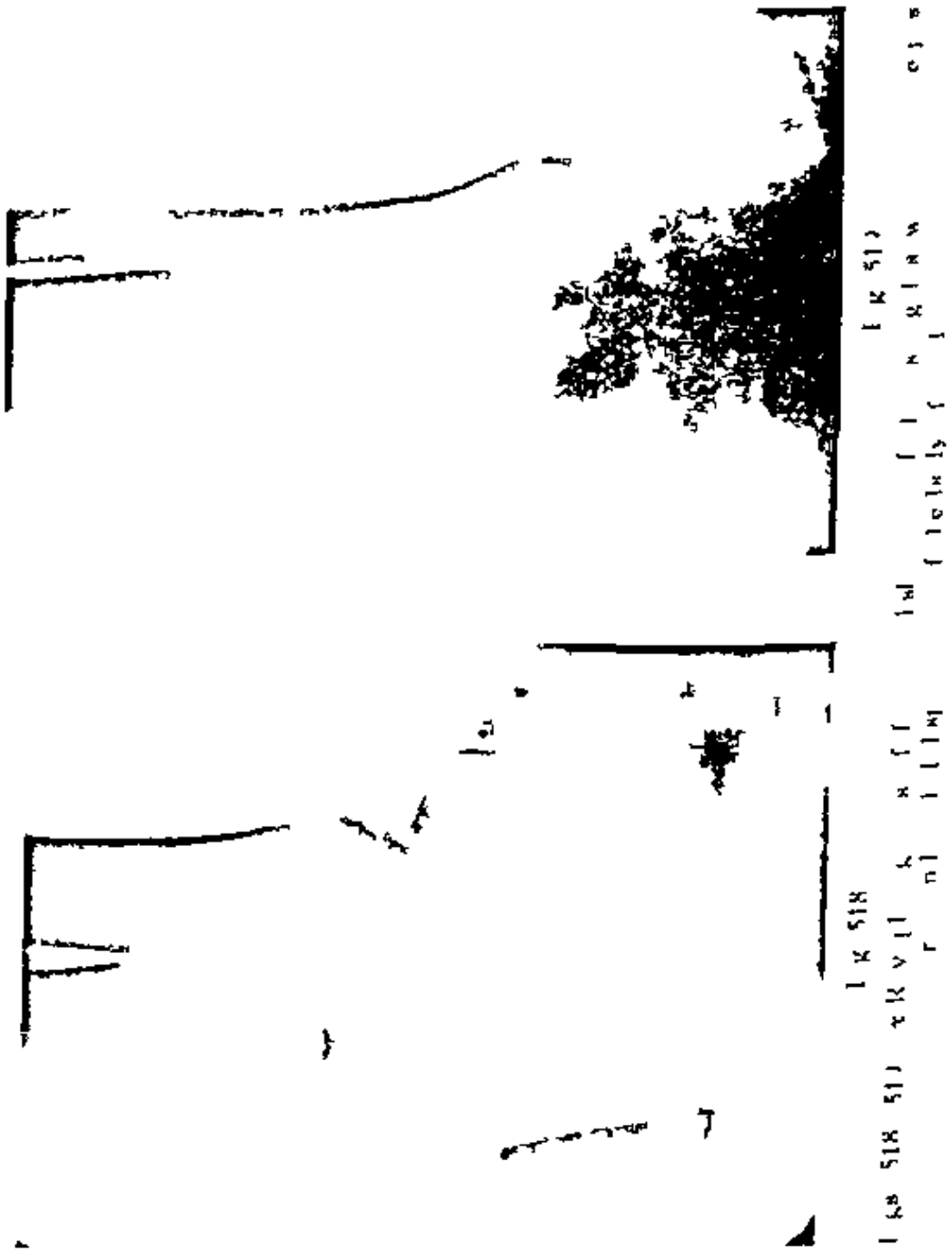
over a bulging of bone-like hardness behind the internal malleolus Motion of the foot was impossible and pain was marked The skin over the abnormal bulging seemed to be on the verge of dissolution x Ray plates disclosed fracture through the neck of the astragalus with complete luxation of the body of the bone backward and inward and comminuted fracture of the tip of the internal malleolus (Figs 518 519)

Under ether anesthesia an attempt was made to reduce the dislocated fragment this being unsuccessful open operation was resorted to With the fragment fully exposed we were unable to force it into position and the seminecrotic condition of the overlying skin and fat tissue did not seem to warrant our carrying our incision through adjacent tendons in order to permit sufficient separation of the tarsus and tibia for reduction The entire astragalus was therefore removed

Formerly astragalectomy was regarded as the correct procedure in cases of dislocation of the astragalus since reduction without open operation is difficult—although sometimes possible when combined with tenotomy of the tendo achillis or other resisting structures—and open operation was considered a grave risk Later astragalectomy was reserved by most men for cases of compound dislocation as it became evident that reduction could be made easily if the incisions were radical enough and that even though the fragment of astragalus were completely detached it was capable of living if restored to its normal position Lately even compound injuries have ceased to be regarded as demanding astragalectomy In such instances we are advised to irrigate the wound thoroughly with a gallon or two of warm normal salt or a weak hydrogen peroxid solution remove all foreign matter excise devitalized tissue and after reducing the dislocation make a primary closure of the wound if necessary in order to obtain closure it is permissible to slide skin flaps from neighboring areas even leaving such areas raw rather than fail to cover the site of the dislocation (Preston Fractures and Dislocations Diagnosis and Treatment St Louis 1915 p 692) If suppuration ensues drainage is required

The degree of disability following astragalectomy in these

I saw him on the following morning He presented numerous cuts and bruises about the head and shoulders a fracture of the right carpal navicular a huge abra ion of the left thigh and



knee and the le-ion of the right foot which I have already men tioned The skin about the ankle was the site of the most extreme ecchymo es there were several blebs the largest lying

weight bearing in less than four months In old fractures, with deformity, astragalectomy usually gives the best results

The patient before us wore a cast for ten weeks, walking in the cast during the last two weeks of that period We then applied a Gibney dressing, which was worn for several months He has now been working full time for about six months and wears no support other than his shoe

traumatic cases is quite variable The patient before us represents an average case He limps noticeably yet he is working full time as a mechanic in a wagon repair shop and experiences little difficulty

The mechanism of the production of fracture-dislocation of the astragalus is interesting Apparently the displaced fragment is projected from its bed just as one may cause a pea to be expressed from the pod this may occur as the result of combined extension and torsion of the foot in which circumstance the dislocation will be anterior or in excessive dorsal flexion with or without torsion (Stealy Surgery Gynecology and Obstetrics, vol 8 p 36 January 1909) The usual cause of dislocation is a fall from a height It is stated that the higher the fall, the lower the fracture In falls from a considerable height the os calcis is likely to be the bone fractured in falls from lesser heights the astragalus in still shorter falls the bones of the leg (Brooke Medicine and Surgery vol 2 p 530 May 1918)

Fractures are usually of the neck or body of the bone They may be simple fissure fractures or may be characterized by marked comminution they are sometimes of course compound In those involving the neck there is generally marked displacement and rotation of fragments especially of the anterior one. When the anterior fragment is displaced reduction is often accomplished by manipulation and the end result is fairly good from the functional standpoint When the posterior fragment that is the body of the bone is displaced backward the functional result generally is poor unless an open operation is resorted to and the dislocated fragment forced into its normal position

The following is a summary of Brooke s observations on this subject Fracture of the astragalus is more frequent than is commonly supposed When fracture occurs without displacement immobilization is all that is required and the end result is usually normal function When there is marked separation or

CLINIC OF DR WILLIAM THOMAS HARSHA

Illinois Central Hospital

ACROMEGALY

Summary Diagnosis of acromegaly current speculations concerning etiology treatment of little value

This man is American born He is fifty years old married, and a steamfitter by occupation The history is as follows

Complaint—(*a*) Headaches (*b*) frequency of urination

Onset and Course—The headaches have been present for about one year they occur at any period of day *i e* day or night There is no special localization—may be either frontal or basal or both There has been no preceding aura no gastro intestinal disturbance accompanying headache no change in vision no muscular weakness Appetite is good and bowels are regular

Urination—Frequency seems to accompany headaches at which time he has to urinate two or three times a night

Previous Illness—Childhood diseases No illness remembered during adult life

Family—Father died at seventy six mother living Four brothers and four sisters living and well No history of tuberculosis carcinoma or nervous disorder in family

Sexual—Gonorrhea twenty six years ago Denies luetic infection

Habits—Used alcoholic beverages freely until eight months ago Smokes cigarettes occasionally Eats and sleeps regularly

Marital—Married twenty five years No children living, one still birth one died at one year, another at two years, wife had two miscarriages

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Marital—Married twenty five years No children living, one still birth, one died at one year, another at two years wife had two miscarriages

Heart—Borders normal tones clear, no murmurs

Abdomen—Liver and spleen not palpable no tenderness, no tumor masses

Extremities Upper There is marked thickening of the fingers and clubbing of the distal phalanges Lower There are no marked changes The toes appear of normal proportions

Reflexes—Abdominal cremasteric patellar and plantar are lively no Babinski no ankle clonus

There is thickening and hypertrophy of the bones especially about the chest The clavicles ribs and sternum are larger than normal Other bones which are hypertrophic are the maxillæ and the bones of the hands

The arteries which are palpable are moderately sclerosed The pulse is strong regular and equal on both sides

Blood pressure is 190 systolic and 126 diastolic pulse pressure 64

No change shown in the testes and function is normal

Examination of the eyes February 2 1919 was reported by Dr Lane as follows

Right vision—20/25ths plus 2

Left vision—20/20ths minus 1

No pathologic findings (normal disks)

Examination of gastro intestinal contents revealed no striking abnormality

The urine contains a trace of albumin and a few granular casts The average quantity secreted in twenty four hours is about 2200 c c

Blood examination is negative for pathologic changes

x Ray examination made of the sella turcica was reported as follows

Anterior and posterior clinoid processes elongated so they meet and completely enclose the sella otherwise normal (Fig 522)

Such a deformity of the sella has not been proved to be of clinical importance

In the case of the vertebræ feet knee and shoulder the reports were as follows

Physical Examination —The patient is a fairly well built and nourished male not acutely ill

Head and Neck —The face is lengthened the lower jaw protruding beyond the upper the nose is enlarged and the lips thickened No adenopathy or enlargement of neck Thyroid normal (Figs 20 21)

Eyes —React to light and accommodation

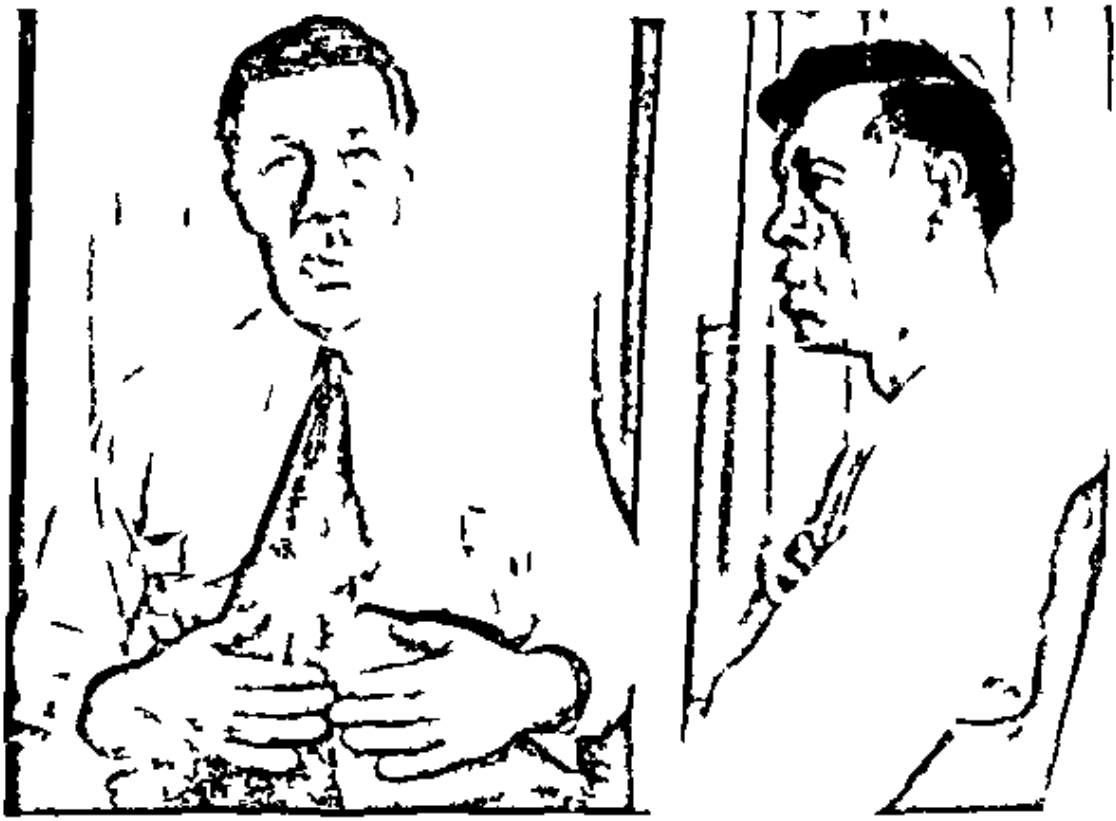

Fig 20 Fig 21

Figs 20 21 Photographs of patient described in the text showing acromegalic changes in hand and face

Ears Not unusually large

Mouth —Teeth are in very poor condition carious The roof of the mouth is very highly arched and forms an acute angle The alveolar margin of the upper maxilla is markedly hypertrophied

Chest —Symmetric expansion limited but equal on both sides

Lungs —No dulness or rales

Fig 523

Fig 524

Figs 523 524 —Hyperostosis and arthritic changes, those in Fig 523 strongly resembling the changes found in hypertrophic osteoarthritis

"Marked proliferative changes and spur formations involving all lumbar vertebræ bones forming the shoulder and knee-joints (Fig 523) and distal phalanges of both feet (Fig 524)'

On the basis of the preceding clinical examination we have made the diagnosis of acromegaly and chronic interstitial nephritis

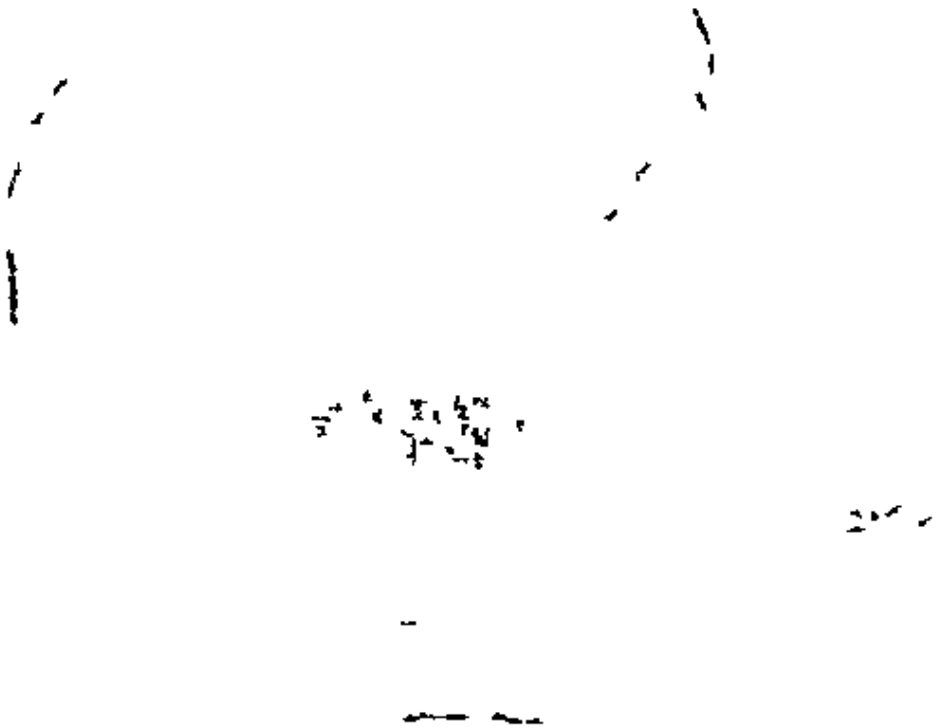

Fig 527—x Ray photograph of skull of patient with acromegaly The sella is not enlarged in this case Note the exaggeration of the normal bony prominences particularly the marked lengthening of the lower jaw

The bony overgrowth of acromegaly has always received a great deal of interest The function of causing the overgrowth is usually attributed to the hypophysis and often associated with acromegaly an increase of chromophile cells is seen in the anterior lobe Adenomata rich in chromophile cells cysts and other tumors of the hypophysis are also often present in cases of acromegaly

The theory is that there are separate types of functionating

fishes and reptiles and it has been suggested that the results of the study of such material may even afford support to the present theory of the pathogenesis of such lesions [6]

The interesting feature in our case is the presence of the hypertrophic changes which are often associated with infective processes in the individual and also the presence of the physical characteristics of acromegaly

The changes seen in the plates are most marked in the hands, feet, and lower jaw Hypertrophic changes, exostosis formation, and spurs are also shown in the vertebræ, femora, ilii, and cranium The mandible shows considerable overdevelopment, giving the profile marked prognathism (Fig 522) The cast made of the mouth shows overdevelopment of the alveolar arches and a high palatal arch The skull shows increase in the occipital and glabellar prominence The sella turcica is apparently normal No increase in the size of the pituitary fossa is shown by the plate

It is of interest that the bony overgrowth is more marked at the tip of the extremities than elsewhere The distal phalanges of the hands and feet show the most marked hyperostosis The exostoses spring from the cortex and its periosteum and no ingrowth into the medullary cavities of the bones is seen The cortex medullary relation is normal The hyperostoses are apparently accentuations of the normal roughenings and tuberosities of the bones

The similarity of the changes seen in the bones to those which are usually associated with chronic hypertrophic osteo arthritis is an interesting feature of the case

There is of course no effective treatment Occasionally it may be desirable to operate in the presence of tumors which compress the optic nerve and thus destroy vision In such cases operation should be done early if it is to be of greatest value, operation is useless after the patient has become blind

Experimental work has determined some of the effects of gland extirpation [7 8] deposition of fat, sex atrophy, and failure to develop secondary sex characteristics resulting from the removal The effect however, of increase in function of the hypo-

cells within the interior lobe of the hypophysis and that a predominance of one cell type determines acromegalic characteristics Recent histologic studies give some support to such a theory of pathogenesis [1]

Edward Uhlenhuth [2] in discussing metamorphosis in amphibian larvæ, suggests the presence of special chemical mechanisms as necessary to the development of the different characteristics

According to Uhlenhuth Development of the skin coloration as well as development of the legs sex organs tongue and palatal teeth are all caused by substances not identical with the substance causing metamorphosis and since they are also all independent of each other in their development it is probable that a special chemical mechanism exists for the development of each one of these six groups of organs The noteworthy fact of the amphibian metamorphosis is that instead of being controlled and kept in harmony by the organic individual the development of at least six groups of organs is controlled separately by the action of probably six different chemical mechanisms each of which can be stopped or enforced independently of each other by directly supplying the substance required or by causing an increased formation of it within the body by suitable temperatures

In accordance with this idea acromegaly may be an expression of the unbalanced chemical mechanism resulting from changes in the activity of the hypophysis

The interrelationship of pituitary and thyroid has been often suggested [3] Allen [4] has shown that tadpoles from which the thyroid and pituitary have been removed show progress toward normal metamorphosis upon being fed iodin and Hoskins has shown that thyroidectomy prevents metamorphosis in amphibia at least for two seasons one and one third years if the animals are kept on a normal diet A chemical mechanism similar to that postulated to exist in acromegaly has been shown to exist in a plant organism by Jacques Loeb [5]

That bone changes of the kind shown in this case are not new to animal life is shown by the presence of such changes in fossil

CLINIC OF DR THOMAS J WATKINS

ST LUKE'S HOSPITAL

AMENORRHEA AND STERILITY DUE TO FUNCTIONAL ENDOCRINE DISTURBANCES

Summary A patient with functional disturbances suggestive of loss of balance of the glands of internal secretion recovery following administration of corpus luteum and thyroid extract

MRS F K K, aged thirty one consulted me December 18 1916

History—*Married eight and a half years, weight 156 pounds,* a gain of 30 pounds in one year Family history was good She had always enjoyed comparatively good health

Present Illness—Illness consists in irregular menstruations, with periods of amenorrhea rapid increase in weight, sterility, and extensive and abundant growth of hair over various parts of the body

Puberty occurred at thirteen She was fairly regular for ten years There is no history of infection of either the patient or her husband

The growth of hair on the abdomen is of the male type

Abdominal and vaginal examinations revealed no pathology The uterus and ovaries were easily palpable and apparently well developed

Diagnosis—The diagnosis was disturbance of function of some of the ductless glands

Treatment—The cervix was dilated and she was given 5-grain capsules of corpus luteum three times daily Free menstrual discharge occurred after taking five of the capsules

January 27, 1917 she reported having had three menstrual periods in one month The corpus luteum was stopped and directed to be taken when needed to relieve amenorrhea

physis has not been definitely determined and the relation of bone changes to pituitary function is yet debatable

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hair after the glandular treatment was instituted The fact that she was sterile for eight and a half years and that there had never been any pelvic infection suggests that the pregnancy was made possible by the treatment

The patient had peculiar periodic sensations in the head which were attributed to disturbances of the hypophysis There was a feeling of much fulness in the head when menstruation did not appear, which was relieved by menstruation The obesity and excessive development of hair are generally considered to be due to disturbance of the hypophysis Studies of tumors of the hypophysis have proved that there is a rather close functional relation between the hypophysis and corpus luteum Menstrual disturbances are of importance in the diagnosis of tumors of the hypophysis Menstrual disturbances of puberty seem to be closely related to the enlarged thyroid which is common at that age The tendency for the thyroid gland to enlarge during pregnancy also suggests that the corpus luteum and the thyroid are functionally associated

March 30, 1917, Dr Edward Reynolds, of Boston, to whom she was referred, reported an enlarged left ovary, probably a corpus luteum cyst, which he thought resulted from the use of corpus luteum

On June 5, 1917, reported that she had a normal menstruation in April which lasted two weeks No menstruation since then That was the only menstruation since January, 1917

June 20th reported that a normal menstruation followed dilatation of the cervix and the use of corpus luteum tablets From this time she was directed to take corpus luteum tablets at the time of each approaching menstrual period, and to take a small amount of thyroid tablets during the intermenstrual period

On September 26, 1918, she reported that menstruation had occurred each month The enlarged left ovary had become normal in size

April 29, 1919 Has not menstruated for five months Examination shows a pregnancy of about five months' duration.

August 27, 1919 Patient gave birth to a child two weeks ago

This detailed history is given as it is of interest to show the effect on menstruation from the use of corpus luteum and from dilatation of the cervix. The thyroid tablets were probably also of some service

REMARKS

Although it is not possible to draw any conclusions from one case, there were a number of conditions present in this patient that are of much interest The menstrual periods could be produced regularly by treatment They would stop when the treatment was suspended At times it was impossible to bring on menstruations by corpus lutuem and thyroid except in conjunction with dilatation The relation of corpus luteum and thyroid to menstruation is so generally recognized as to need no special comment here The probable effect of dilatation of

CLINIC OF DR EDWARD LOUIS MOORHEAD

MERCY HOSPITAL

MULTIPLE UTERINE FIBROIDS: SECONDARY ANEMIA, NEPHRITIS

Summary A patient with severe secondary anemia and chronic nephritis who presents a large uterine tumor plan of treatment adopted—results

MRS B, aged forty eight years, American, married We have asked this patient to return this morning that you may see the results in a case in which the prognosis at the time of entrance to the hospital was not very good

There is nothing unusual in her early history, no special illness that she remembers except measles and the minor diseases of childhood Menstruation began at fourteen years, has always been regular and not attended by any special pain or discomfort Her appetite has always been good, bowels regular, no headaches Weight has remained about the same (160 pounds) for several years previous to her present complaint She was married when twenty-five years of age and has one child who is twenty-one years old There is no history of any miscarriage and she does not know of any reason why conception did not occur again At the time of the birth of her child, twenty-one years ago, her husband says the physician in attendance stated "that there was a small lump or tumor near the womb" No further attention was paid to this, and the husband did not inform the patient of what the physician had stated

Five years ago, while visiting one of the health resorts (Hot Springs), the physician in attendance there informed her that she had albumin in the urine Nothing was done for this she states, except that she drank the water at the Springs for the time being

Six months previous to her admission to the hospital she had a profuse uterine hemorrhage, occurring between the regular

Blood pressure—Systolic 110 diastolic 75 pulse pressure, 35

Urinalysis—1190 c c in twenty four hours Specific gravity 1010, reaction alkaline, albumin 3 plus—quantitive 15 grams per liter or 0 15 per cent sugar none granular and hyaline casts many

Diagnosis—Multiple uterine fibroids secondary anemia and chronic nephritis

What to do in this case was a question It was quite evident that the patient could not withstand another hemorrhage Her general condition the secondary anemia and the nephritis made the danger of anesthesia and operation very great Under these conditions the patient was given absolute rest as nutritious a diet as the condition permitted medication for the heart and anemia and we waited hoping that before another hemorrhage would occur the patient s condition would have so far improved that she might be operated on

The patient progressed fairly well for three weeks when hemorrhage began again and in order to prevent the loss of what gain she had made operation was performed at once The blood examination at this time showed 14 250 leukocytes 3 950 000 erythrocytes hemoglobin 45 per cent

Urinalysis—Specific gravity 1010 reaction alkaline albumin 2 plus sugar none hyaline and granular casts

You will readily agree with me that the prognosis in this case was not good My greatest concern was for the anesthetic but I am glad to say to you that I have never had a better anesthetic given a patient of mine There was complete relaxation allowing the rapid removal of the tumor and yet the patient was practically awake before the dressings were applied and she was removed from the operating room There was no postoperative emesis no distention of the abdomen or gas pains She did not receive any morphin following the operation The functions of the bladder and rectum were performed without any aid In fact the postoperative history of the case has been ideal and I assure you that the careful administration of the anesthetic had a great deal to do with it

The tumor which will be passed around for your inspection,

menstrual periods, but she attributed it to '*the change of life*' as she says her friends told her that was a common occurrence. Two months previous to her admission to the hospital there was another hemorrhage more profuse than the previous one and a physician was called. He gave her some medicine to take and after remaining quiet in bed for a few days the hemorrhage ceased. The physician who attended her at this time made no examination to ascertain the cause of the hemorrhage, but allowed the patient to remain under the impression that it was not unusual and was probably due to the menopause.

Following this last hemorrhage the patient was very weak. She could not stand any exertion. There was difficulty in breathing. Upon the slightest exertion respiration became labored and irregular. Her color was very pale and there had been some loss of weight.

Nine weeks ago the patient was admitted to this hospital. Her condition at that time was very bad. She was very pale waxy in color. The respiratory movements were irregular and labored at times. A few rales were heard over both lungs. Cardiac dulness increased, apex beat slightly to the left and 1½ inches below the nipple. A soft systolic hemic murmur present.

Abdomen.—A large tumor mass extending as high as the umbilicus on the right side and upward toward the costal arch on the left side was outlined by palpation. Upon bimanual examination this tumor mass was found to be intimately connected with the uterus. In fact, the uterine body could not be made out separately from the tumor, which filled the pelvic basin and extended high up almost to the costal arch on the left side. The mass which was nodular, was movable to a fair degree in the upper portion, while that part within the pelvis was more or less fixed.

Blood examination at this time gave 5000 leukocytes per cubic centimeter, erythrocytes 3 000 000 per cubic centimeter. Differential white count showed 68 per cent polymorphonuclear neutrophils, 27 per cent lymphocytes, 2 per cent large mononuclears, 3 per cent polymorphonuclear eosinophils. Hemoglobin, 40 to 45 per cent.

EPIGASTRIC HERNIA—HERNIA OF THE LINEA ALBA

Summary Pathologic anatomy of hernia of the l nea alba techn c of cura tive operation

Mr T C is forty nine years of age an Italian laborer He gives no history of previous illness or injury Has always done heavy work as a laborer Four months ago he began to have pain in the epigastric region At first it was more of a burning sensation later the pain became more marked and there was nausea and vomiting following the eating of his meals He says that he also has to belch a great deal of gas A short time after he began having pain a small nodule was noticed in the median line of the epigastrium about 2 inches above the umbilicus This nodule has increased to the size of a walnut when he is lying down but when he stands up or strains as in coughing the mass increases to about the size of a small fist He has lost some weight because he says that when he eats the pain and vomiting distress him so much that he would rather not eat

There is nothing unusual in the physical examination of the patient except this mass in the midline above the umbilicus of which he complains

The diagnosis is quite plain There is a swelling in the mid line or linea alba above the umbilicus The swelling disappears to a great extent but not en'irely when the patient lies down There is an impulse communicated to the mass when the patient coughs Some tenderness is complained of when pressure is made over the mass Plainly we h ve to deal with a hernia of the linea alba or an epigastric hernia All hernias that occur in the midline of the abdomen with the exception of those that occur at the umbilicus are called hernias of the linea alba They are more frequent above the umbilicus than below owing to the greater width of the linea alba above the umbilicus Longi tudinal bulgings of the linea alba are occasionally called hernia but they are not hernia in the true sense of the word because

consists of a mass of fibroids of the uterus (Fig 525) It measures 11 x 8 x 6 inches The left side is larger than the right. Two of the fibroids on the left and one on the right side were intraligamentous The body of the uterus has been opened disclosing several submucous fibroids one about the size of a small egg The body of the uterus is rather soft to the touch, evidently undergoing degenerative changes

Today, six weeks following the operation the blood examination gives leukocytes 6000, erythrocytes 4 100 000 hemoglobin 85 per cent

Fig 525 —Uterine fibroid removed at operation on case demonstrated

Urinalysis —Specific gravity 1018 reaction alkaline albumin good trace sugar none granular and hyaline casts a few

The patient s color has improved a great deal There is no longer any difficulty of respiration heart action good pulse 80 appetite good bowels regular Patient takes exercise in the open air every day either walking or motoring and says that she is feeling very good We are very much gratified at the result in this case and the patient will be advised to place herself under the care of an internist for such future medical treatment as her condition may require

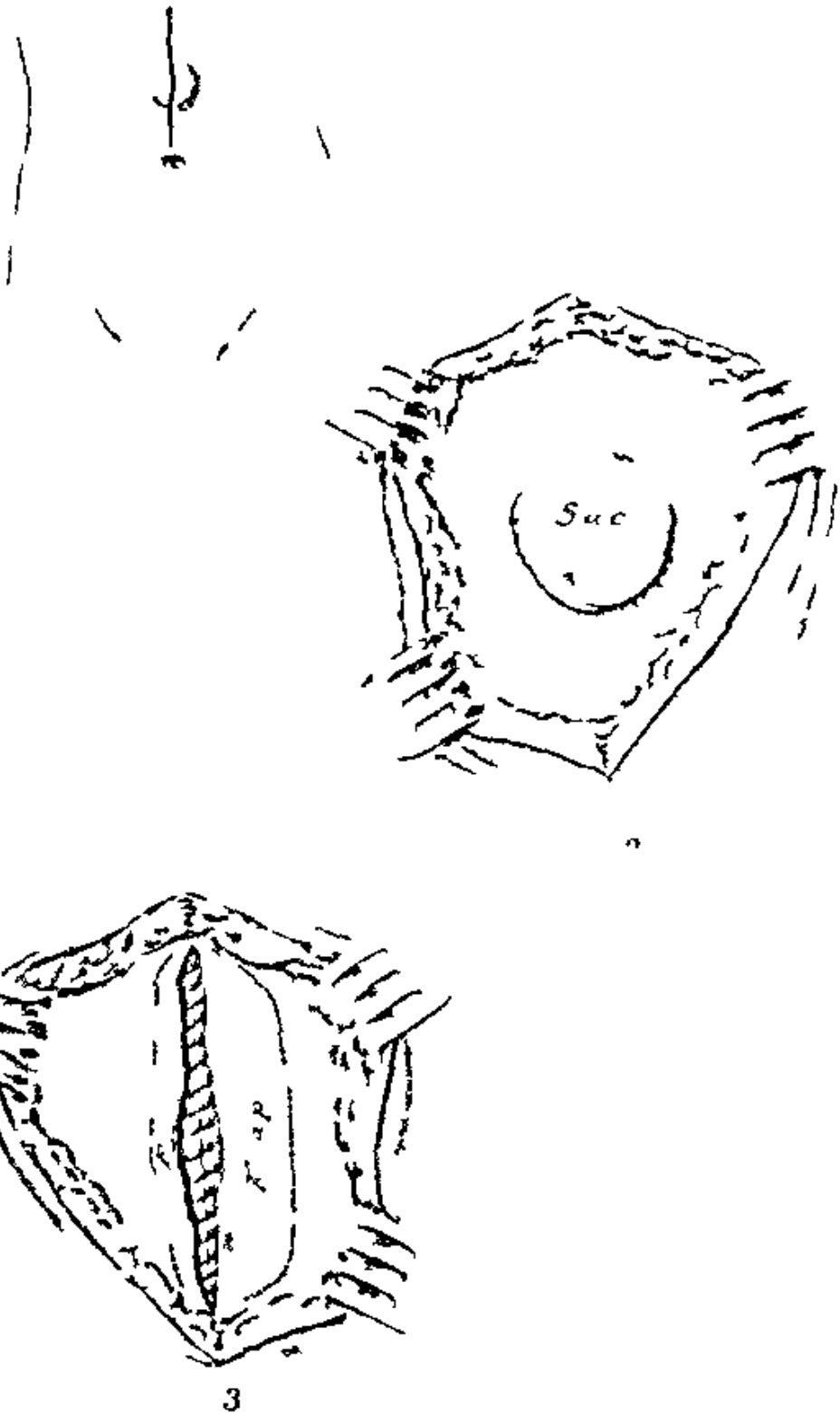

Fig. 526.—1. Incision made over middle of bulging. 2. Skin and superficial tissues retracted exposing sac and rectus fascia. 3. Sac excised, peritoneum closed and flaps sutured in rectus fascia.

there is no defect in the transversalis fascia These bulgings are caused by wide separation of the recti within their sheaths

Epigastric hernia vary greatly in size, some may be no larger than a pea, others again may attain the size of a fist The larger sizes usually occur in the immediate vicinity of the umbilicus.

The linea alba is an aponeurotic structure formed by the union of the sheaths of the recti on either side It is broader above the umbilicus than below, and is in relation posteriorly with the peritoneum, but separated from it by the transversalis fascia

These herniæ consist frequently of protrusions of subserous fatty tissue through congenital or acquired openings in the linea alba, and resemble lipomas A portion of peritoneum is drawn through the opening into the center of these masses when they have persisted for some time, and true hernias are thus induced Considerable pain and abdominal distress vomiting colic, etc., are caused partly by traction on the peritoneum and partly by constriction of the neck of the sac against the sharp edges of the small opening

Treatment.—In some of the smaller hernias of the linea alba it is questionable if there is a true hernial sac In the present case, on account of its size, the fact that it can be partly reduced and the impulse communicated when the patient coughs I am convinced that we have a true hernia of the linea alba

Operation —Ether anesthesia The patient having been properly prepared, an incision about 3 inches in length is made over the center of the protruding mass (Fig 526, 1) Care must be exercised in carrying the incision through the covering of the hernia in order to avoid injury to any of the structures which may be found in the hernial sac The skin and subcutaneous fat are dissected back freely on both sides exposing the sheaths of the recti muscles (Fig 526 2) The hernial sac is exposed incised, and the adherent omentum which it contains is freed and returned into the abdomen The peritoneal opening is now closed with a continuous catgut suture (Fig 526 3)

The sheath of the left rectus muscle is split by a vertical incision about $\frac{3}{4}$ inch from its median edge and the flap reflected

toward the median line The sheath of the right rectus muscle is split in the same manner about ¼ inch from its median edge and the flap reflected toward the median line With chromic catgut an interrupted mattress suture is now placed beginning about ½ inch from the free edge of the flap of the rectus sheath on the right side and returning through the flap on the left side It will be necessary to place four of these sutures and when they are tied the posterior sheath of the right rectus with the transversalis fascia is brought into apposition and underneath the *flap of left rectus sheath with the transversalis fascia* (*Fig* 526 3 Fig 527 4) The free overlapping edge of the left rectus sheath is now sutured with a continuous chromic catgut suture to the anterior sheath of the right rectus By this method the strongest tissues (the fasciæ) are utilized in forming a new abdominal wall There should be no tension on these flaps when brought together The external opening is closed by interrupted silkworm gut sutures These sutures are passed from the left side first through the skin then picking up the free edge of the left rectus sheath then the center of the fascial flap and finally through the skin of the right side (Fig 527 5) A few superficial sutures are taken to coapt the skin edges and then the interrupted silkworm gut sutures are tied over a strip of gauze but not too tightly This obliterates all dead space in the wound The operation is now completed and there is a good firm abdominal wall made up of the best tissues available for that purpose The external sutures will be removed about the tenth day and there is no doubt that a cure will be obtained in this case

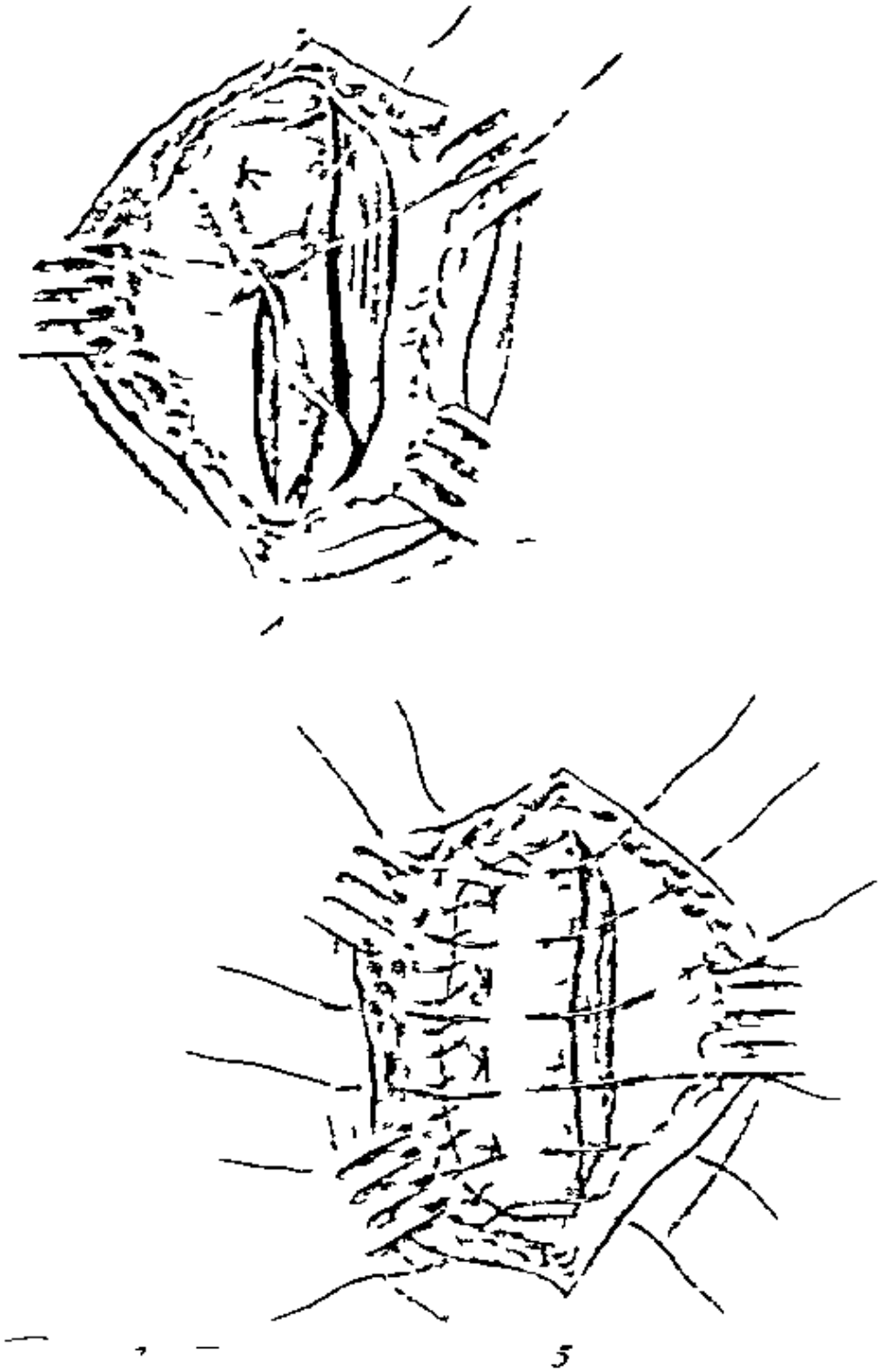

Fig. 527.—4. Flaps of anterior sheath of rectus muscles imbricated over site of hernia by mattress sutures. 5, closure about to be completed by means of silkworm-gut sutures including skin and rectus fascia as indicated.

GUNSHOT WOUND OF THE BUTTOCK

Summary A patient with a gunshot wound of the buttock in which the bullet apparently traversed the pelvis without injury to the pelvic viscera value of stereoscopic roentgenograms in cases of this type

G B aged seventeen years schoolboy This patient is a victim of the race riots which have been going on for the past few days Briefly the history is that while walking down the street on his way home in company with several other boys about his age he encountered a crowd and fearing trouble started to run in the opposite direction The boy says that he had not gone very far when he experienced a severe burning stinging pain in the buttocks and he immediately dropped to the side walk He was unable to get up and walk Whether his inability to do so was due to the attending fright or the injury itself could not be determined at that time He was placed in an ambulance and removed to the hospital

Upon examination shortly after his admission to the hospital the patient was found to be a healthy looking boy well nourished and with no other complaint than that due to the present injury He was in a highly nervous state and complained of severe pains in the buttocks

The only external mark of injury that could be found was the wound of entrance of the bullet which was situated about ½ inch below and to the inner side of the tip of the greater trochanter of the right femur

An *x* ray plate made with the boy lying on his back shows the bullet apparently behind and above the tuberosity of the left ischium How the bullet could travel across from the right to the left side without injury to the bladder or rectum is very difficult to explain

The patient has voided urine and it is perfectly clear, it contains no blood By rectal examination no injury of the rectum can be determined It is now twenty four hours since the injury occurred and there have been no symptoms developed indicating injury to any important structure or organ

entire right limb carried forward This gives practically the left lateral or Sims' position The incision about 2½ inches in length, is made directly upon and down to the tuberosity of the left ischium Care will be taken to avoid cutting important structures the muscles being separated in the direction of their fibers Having come down to the tuberosity of the ischium a blunt dissection is now made upward on the pelvic side of the bone The incision is not so large as to allow one to see definitely in the bottom of the wound hence one must depend to a certain degree upon the sense of touch If the bullet is not encountered soon the incision will be enlarged By carefully dissecting our way upward for a short distance I believe that the instrument in my hand is in contact with the bullet in fact I am sure of it and the bullet is now extracted by the use of a forceps The bullet is somewhat roughened from its contact with the bone in which it was slightly embedded The distance from the point of entrance to the point where the bullet was found is about 8 inches

The wound will be closed in the usual way A small gutta percha drain will be inserted and allowed to remain for forty eight hours

Before finishing this operation I want to see if it can be determined how the bullet went across from the right side to the left side A flexible probe is introduced into the wound of entrance and the track of the bullet followed This leads down to the coccyx and its further direction is lost It did not pass posteriorly to the coccyx of that we are certain and yet by rectal examination the rectum is found to be in very close relation to the coccyx and it is difficult to understand how the bullet could have passed across without injuring the rectum The position of the bullet would indicate that when it struck the pelvic side of the ischium its further progress was arrested and it was turned upward and slightly embedded in the ischium It is remarkable in some cases of gunshot wounds the course that a bullet may take and at the same time not produce any serious injury to the various structures or organs which apparently are in the trail one would think the bullet had taken

This first x ray plate, which was taken with the boy lying on his back, shows as stated before the bullet apparently behind and above the tuberosity of the ischium However, this kind of a plate is not satisfactory in a case of this type The bullet has traveled from one side to the other, and keeping in mind the formation of the pelvic bones I have disagreed with the interpretation of this plate given to me and therefore have had a set of stereo x ray plates made By studying these stereoplates,

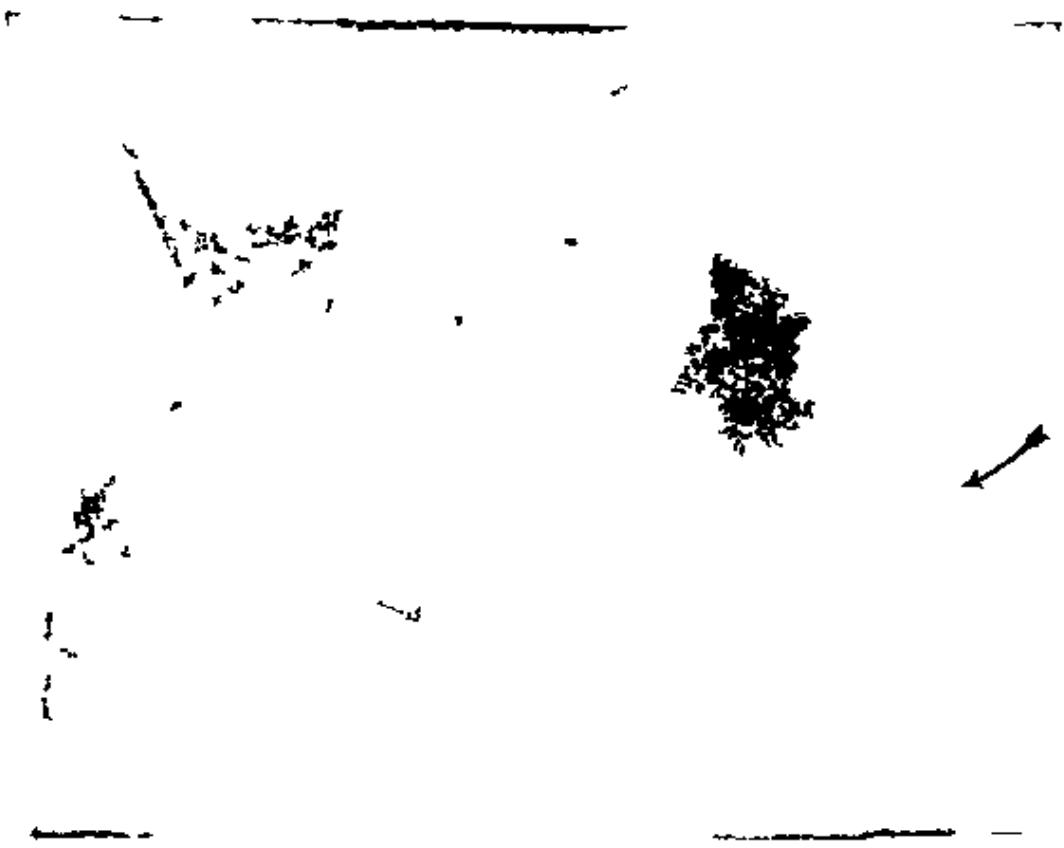

Fig 528—x Ray photograph showing bullet embedded in left ischium the point of entrance was over the greater trochanter of the opposite side

the position of the bullet is shown to be to the pelvic side and slightly embedded in the ischium about $\frac{5}{8}$ inch above the tuberosity (Fig 528) In cases of this kind as well as injuries to the joints the skull the thorax or abdomen it is much more satisfactory to make stereoplates than to use the ordinary single plate

Operation—Ether anesthesia The patient has been prepared and he will be placed upon his left side the right leg flexed upon the thigh and the thigh upon the abdomen, and the

CONTRIBUTION BY DRS WESLEY J WOOLSTON AND W B WHITE

COOK COUNTY HOSPITAL

REPORT OF 1000 PATIENTS OPERATED ON FOR TUBAL INFECTION

Summary High percentage of patients once operated on for pelvic disease requiring secondary operations mistakes in diagnosis and failure to remove all diseased tissues chief factors responsible notes on choosing method of treatment

THE object of this report is not to offer any new form of management in the treatment of tubal infections but to condemn the practice of unnecessary or incomplete operations, and to emphasize the necessity when operating, of removing all the pathology

Women who have had a unilateral salpingectomy oophorectomy salpingo-oophorectomy or double salpingectomy often leaving an infected uterus tube or portion thereof frequently are seen by the gynecologist because they complain of as many if not more symptoms than they had before operation

Because so many of these cases are seen we thought it would be of interest to ascertain the percentage coming to operation who had previously been operated upon for pelvic infections In the last 1000 cases operated upon at Cook County Hospital 49 or 4 9 per cent had had partial removal of the reproductive organs such as oophorectomy salpingectomy or more frequently salpingo-oophorectomy

Besides these cases there were a number who were found at operation to have had a chronic pelvic infection yet had undergone some irrelevant operative procedure for the condition These operations consisted of curetments round ligament operations and appendectomies From the histories of these cases

the climacteric she may submit to a radical operation, whereas, a patient who has no children but who is within the child bearing age and desires motherhood, can afford to take conservative measures over a longer period of time, hoping that nature will heal the tubes so that conception may take place

If operation has been decided upon, which, of course, is never during an acute attack one should be sure and remove all the pathologic tissue which is so often only partially removed In the gonorrheal form the infection is practically always in both tubes as well as in the *pars interstitialis* This means a hysterectomy or an amputation of the uterus which is sometimes called a Bell Beutner operation as modified by Pollak In the streptococcic form of infection in which the patient has survived the acute stage but where symptoms remain, operation is delayed as long as possible as latent organisms are sometimes aroused to activity by operative interference and an apparently simple case will die of streptococcic peritonitis

Following hysterectomy, if care has been taken to cover all the raw edges which have been created by the removal of the uterus with the reflected peritoneal surface of the bladder, very few adhesions will take place even in the cases where many adhesions previously existed This procedure also holds the stump of the uterus forward and the bladder upward In view of this fact fewer symptoms follow hysterectomy than in days gone by when a hysterectomy often left much trouble In the high amputation operation menstruation can be preserved and still the pathology be removed In doing this operation one might ask, Why preserve the menstrual function? Although its preservation is considered purely sentimental by some it seems worth while where we can safely do so We must however remove all pathology irrespective of age or other conditions

and the pathology found at the second operation it seemed probable that the original trouble was tubal in origin. In the 1000 cases there were 89 or 8 9 per cent in this class These cases do not include acute salpingitis nor do they include cases where infection occurred subsequent to the first operation as near as we could ascertain Of the 1000 cases operated upon for chronic salpingitis therefore 138 or 13 8 per cent. had previously been operated upon because of symptoms referable to the pelvic condition These figures are almost certain to be too low inasmuch as a large number of cases who still had trouble would not return and many who did return refused operation or were not operated upon for some other reason

Another point of interest in this series is the death rate which is 2.5 per cent The average age of these patients is 29½ years

We do not mean to say that sometimes a secondary operation will not be necessary But we believe that the number should be smaller There are cases in younger women where it is highly desirable to save one or both ovaries It is often questionable whether an ovary should be saved or not in such cases we save it as the lesser of two evils In doing so we attempt to preserve the blood-supply to prevent cystic degeneration and still sometimes such an ovary will cause trouble Admitting this we feel that it is still worth while in young women to preserve the internal secretion from the ovary if we can consistently do so However we do not feel that preservation of diseased ovaries is justifiable even in young women

We would divide the treatment of chronic pelvic infections into the conservative and the radical The choice of treatment depends upon the social condition of a patient to a great extent If a person is well to do rest in bed good nursing and general hygienic measures will cure many cases These cases can well afford to risk a certain number of acute exacerbations in the hope that spontaneous healing may occur and operation be thus avoided With the less fortunate patient who cannot afford to

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CLINIC OF DRS GUSTAV KOLISCHER AND J S EISENSTAEDT

MICHAEL REESE HOSPITAL

LESIONS OF THE FEMALE URETHRA: DEMONSTRATION OF FOUR CASES

Summary *Case I*—Neuro-angioma of the urethra—typical clinical picture
Case II—Angioma cavernosum—diagnosis
Case III—Angiosarcoma—characteristic history and findings on examination Discussion of treatment of above conditions—removal by cautery the method of choice—advisability of subsequent radiotherapy in Case III
Case IV—Gonorrheal granuloma—diagnosis necessity of radical treatment by curet and galvanocautery

CASE I—The patient complains of persistent disagreeable sensations in the urethra which occasionally take on the character of sharp pains, beginning at the meatus urethræ and radiating toward the clitoris There is no relation between the act of urination and the occurrence of the annoying sensations and attacks of pain

Inspection of the labia majora is negative The external urethral opening is somewhat gaping and presents, in the lower half of its circumference, an irregular, raspberry like excrescence This nodule is about the size of a large pea, has a broad base, and extends about 3 mm into the urethra The surface is not excoriated is not sensitive to touch, and does not bleed on palpation Urethroscopy and cystoscopy reveal no abnormalities

Such a growth is commonly termed "caruncle of the urethra" The occurrence, however, of spontaneous pain in this tumor suggests the presence of nerve fibrillæ in the lesion

Clinical Diagnosis—Neuro angioma

CASE II—The patient, a woman of thirty five years, reports that the urine is frequently bloody, also that apart from the act

closure with suture may often be not only a difficult and tedious task, but experience has shown that in many instances multiple and rapid recurrences follow The destruction of these growths by the actual cautery is an easy matter and if done thoroughly furnishes lasting results It is a matter of individual preference and not of essential significance whether to cauterize by actual cautery agents by means of the Paquelin, the galvanocautery, or by fulguration

In order to protect the normal mucosa during cauterization an olive wood stick is introduced into the urethra Any of these methods may be done successfully under local anesthesia In order to prevent recurrence in the case of angiosarcoma, cauter ization will be followed by radiotherapy

CASE IV —The next patient is a girl of twenty five who com plains that in spite of treatment administered for over six months she is still suffering from burning during and immediately after urination and that her clothes are soiled by a discharge from the genitals There is a history of gonorrhea acquired about six months ago No intrapelvic pathology has been re corded The urine voided is slightly turbid

The lips of the external urethral orifice are somewhat everted and seem to be swollen Stripping of the urethra by means of a finger inserted in the vagina produces a drop of viscid grayish fluid Microscopic examination of this discharge shows pus cells containing diplococci and other bacteria The vagina and cervix are apparently normal While a steel sound may easily, and without especial discomfort to the patient be passed into the urethra upon its withdrawal a few blood streaks are discovered on its surface This finding calls for ocular inspection of the urethra

Endoscopic examination shows the appearance of several reddish excrescences extending into the urethral lumen If, by introducing a fine curet through the urethroscopic tube the lowest lesion is removed it is seen that *underlying this growth* there is a discolored cleft in the mucosa Examination of the tissue removed shows it to be granulation tissue

of micturition there occurs occasionally a sudden flow of blood from the vulva Menstruation has no relationship to this occurrence Urination is not painful nor are there any abnormal sensations in the parts

Inspection of the external urethral opening reveals the presence of two tumors in the lower half of the circumference of the orifice the lips of which are somewhat protruding These tumors are pedunculated bean size bright red in color and not sensitive to touch Under pressure they loose their bright red color and become pale and reduce in size Close inspection with the magnifying glass shows a minute black spot which has lost its glistening surface. This is seen at the upper surface of one of these tumors. *The black spot just referred to represents the site of* a previous hemorrhage with subsequent clotting

Histopathologically these little tumors show angioma cavernosum a growth made up of cells enclosing blood spaces of variable sizes surrounded by fine fibrous connective-tissue strands and occasionally unstriped muscle-cells

CASE III —This patient states that for quite a period each act of urination has been painful The pain is located at the meatus and persists for some time after the act

The external urethral opening on visual examination shows at its lower margin a tumor the size of a small marble The nodule has a broad base and is grayish red in color The surface is irregular and verrucous. In the center is a discolored crust. Touching this discolored area produces intense pain which is increased by any attempt at detaching the crust The tumor is slightly compressible The crust formation is due to retrogressive changes in the tumor characteristic of a malignant growth

The diagnosis in this instance is angiosarcoma of the urethral mucosa. The pain in this case is due to the inflammatory changes about the margin of the nodule

The surgical indication in all these cases is identical They must all be removed and it is the method of removal only which can be the subject of discussion Removal with the knife and

CLINIC OF DR HERMAN L KRETSCHMER

PRESBYTERIAN HOSPITAL

DIAGNOSIS OF URETERAL CALCULI

Summary Sources of error in interpretation of simple *x* ray plates and of shadowgraph catheter plates showing apparent calculi stereoscopic *x* rays author s method remarks on choice of methods of treatment—indications for open operation retrograde movement of ureteral calculi

MUCH has been written in the past few years about the diagnosis of stone in the ureter and the entire trend of thought has been to render the diagnosis as accurate as possible When ureteral stone work was first done simple roentgenograms were taken, and shadows were seen on the *x* ray plate that were interpreted to be stones but at operation no stone was found With the introduction of the shadowgraph catheter a great many of these shadows were proved to be of extra ureteral origin but a small group of cases remained in which the catheter and shadow producing body were apparently side by side In a few instances such patients were operated upon and no stone found This still left the method of diagnosis by simple shadowgraph catheter and Roentgen ray open to certain chances of error It was then suggested that these doubtful cases should have stereoscopic roentgenograms taken in order to reduce the possibility of error Recently at the Presbyterian Hospital we have been using a new procedure which I described in Surgery, Gynecology and Obstetrics in November 1918 Briefly, this consists of the following

In a given case of suspected stone in the ureter a shadowgraph catheter is passed and the patient taken to the x ray room where a double exposure is made on a single plate with a shift in the tube In cases of stone in the ureter both exposures will show the

Diagnosis—Inflammatory granuloma of gonorrheal origin with fissure formation Further histopathologic examination will invariably show that in the vacuoles of these granulations gonococci are found It is thus easy to explain the persistence of the gonorrhea. As long as these granulations and ulcerations in the mucosa persist infection will be maintained and therapy therefore must be radical. The granulomata should be scraped off by using a sharp curet through an endoscopic tube and the ulcerations thoroughly cauterized with a fine galvanocautery

Urinary Incontinence—For one night during the second attack patient lost control of the urine the urine dribbling more or less continuously for six or eight hours

Menstrual History—Began at thirteen twenty eight day type no dysmenorrhea Married one son and two daughters living and well

Family History—Negative

Physical Examination—Scalp negative Pupils are equal and respond to light and accommodation Impaired hearing in left ear

Chest—Lungs—expansion good no areas of dulness no rales Heart—not enlarged no murmurs

Abdomen—Liver kidney and spleen not palpable No tumor masses felt Slight tenderness on deep pressure in left lumbar region No swelling or other symptoms

Reflexes—Knee jerks absent

Cystoscopic Examination—Bladder negative except for a few slight irregularities at the neck Ureters normal Ureteral catherization easy and without obstruction

Cell Count and Cultures—Bladder 30 right kidney 8 left kidney 230 All three specimens are sterile

x Ray Examination—Shadowgraph catheter in a single exposure shows catheter running to the median side of a stone, double exposure shows shadow under suspicion lying in same relation to both catheters (Fig 529)

Blood Examination—4 100 000 red cells 14 100 white cells 85 per cent hemoglobin

Blood pressure—Systolic 128 diastolic 84

Urinalysis—Cloudy straw colored 1014 alkaline no albumin sugar or casts few epithelial cells no blood

Blood Urea—170 mg per liter chlorids 4 7 grams per liter nitrogen 20 2 grams per liter carbon dioxid 48 1 c c

Wassermann negative

Discussion—A tentative diagnosis of stone in the ureter was made A shadowgraph catheter was passed and the procedure just mentioned carried out In this plate you see that in both exposures the shadow produced by the stone hugs the shadow

shadow of the stone and the shadow produced by the shadow graph catheter lying side by side In cases in which the shadow producing body is of extra ureteral origin but lying in the same plane as the catheter it produces a picture as though the shadow producing body and catheter were lying side by side the second exposure however shows a definite interval between the shadow under suspicion and the catheter This procedure we believe to be of definite advantage in the diagnosis of stone in the ureter and it furthermore reduces the source of error mentioned above—that of misinterpreting an extra ureteral shadow and operating upon a patient unnecessarily

The patient I shall demonstrate this morning presents the following clinical picture

Mrs P aged thirty seven admitted June 16 1919 She was operated on for gall stones in 1904 Never cystoscoped before Had Roentgen ray examinations made in 1917 and 1918 no stone was found

Present Complaint—Pain in the left lumbar region Three years ago while she was getting dinner she was seized with very sharp cramp-like pain in the left side which doubled her up so that she went to the floor on her knees Was immediately put to bed and a physician was called who gave her a hypodermic of morphin The pain subsided and she had no recurrence for the next three or four months While the patient was in the country she was again seized with very severe pains This time the pain was accompanied by chills and fever and the attack lasted about one week The patient was taken to the hospital where she remained for three weeks Three weeks after her arrival home she was again seized with the same sharp cramp-like pain chills and fever She remained home for a week and then went back to the hospital where she remained three weeks during which time she had one attack Since then the patient has had attacks every two or three months which are similar to the previous attacks Three weeks before entering the Presbyterian Hospital she had her last attack During this attack there was nausea and vomiting and some radiation of the pain to the inguinal region

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x Ray Examination—Shadowgraph catheter in a single exposure shows catheter running to the median side of a stone, double exposure shows shadow under suspicion lying in same relation to both catheters (Fig 529)

Blood Examination—4 100 000 red cells 14 100 white cells, 85 per cent hemoglobin

Blood pressure—Systolic 128 diastolic 84

Urinalysis—Cloudy straw colored 1014 alkaline no albumin sugar or casts few epithelial cells no blood

Blood Urea—1.0 mg per liter chlorids 4 7 grams per liter nitrogen 20 2 grams per liter carbon dioxid 48 1 c c

Wassermann negative

Discussion—A tentative diagnosis of stone in the ureter was made A shadowgraph catheter was passed and the procedure just mentioned carried out In this plate you see that in both exposures the shadow produced by the stone hugs the shadow

produced by the shadowgraph catheter (Fig 529) Therefore, I believe, we are justified in making a diagnosis of stone in the ureter

I believe that every patient with stone in the ureter should be treated by non-operative measures first and open operation reserved for the cases in which instrumental manipulation fails

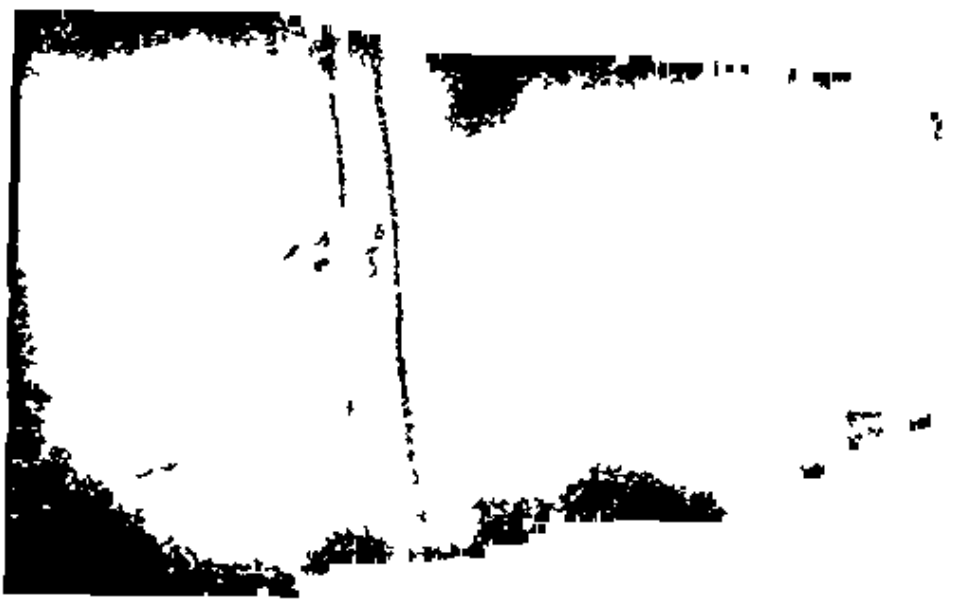

Fig 529 —x Ray photograph illustrating the author s method of diagnosing ureteral calculus With a shadowgraph catheter in place a double exposure is made on a single plate if the shadow under suspicion and the catheter maintain the same relative position to each other in both exposures the diagnosis of ureteral calculus is verified

Accordingly, after we were through collecting the urine for examination we injected 10 c c of sterile olive oil into the left ureter

Following this injection of oil the patient had a very severe attack of renal colic The pain was described by the patient as being lower than in any of the previous attacks She pointed to the pain as being down in the bony pelvis Another roentgen

ogram was taken to see whether or not the stone had moved and this x ray showed the stone located in the bony pelvis so we knew the stone had wandered from its previous position opposite the third lumbar vertebra down into the bony pelvis

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This fact furthermore verified the previously made diagnosis of stone in the ureter (Fig 530)

Note—On July 7 1919 four days after the first injection 15 c c of oil were injected into the left ureter and on July 9th

20 c c of oil were injected We are contemplating further injection

Although this case demonstrated to illustrate the advantage of the method of diagnosis of stone in the ureter just described rather than to dwell on the treatment of such cases by intra ureteral injections of oil or by open operation I shall mention one or two points in connection with the latter It is a well known fact that many cases of stone in the ureter if given half a chance will pass the stone and we believe that open operation should be reserved for cases in which intra ureteral manipulations fail After having given this patient a fair chance with this form of treatment if this treatment fails we will then advise open operation

Operation for stone in the ureter should always be extraperitoneal and never intraperitoneal owing to the danger of the development of peritonitis One fact that must always be borne in mind in the treatment of stone in the ureter whether that treatment be operative or non-operative is the possibility of the stone migrating back up the ureter Cases have been reported in the literature in which a definite diagnosis of stone in the ureter was made and in which at operation no stone was found A subsequent check up by means of the *x* ray demonstrated that the stone had wandered back up into the ureter Occasionally the stone may even wander back into the pelvis of the kidney *Two years ago I had such an experience at the Presbyterian Hospital* The patient had received several intra ureteral injections of oil and then he was called home to West Virginia on urgent business When he returned several months later for his Roentgen ray check up instead of finding the stone in the pelvic portion of the ureter it was found in the lumbar portion In another case in which I had planned to operate for stone after many attempts at intra ureteral manipulations had failed a similar condition was met with The stone was situated in the intramural portion of the ureter and I planned to open the bladder and take out the stone transvesically *Just before* the patient was anesthetized another *x* ray was taken which showed that the stone had wandered back into the ureter between the

third and fourth lumbar vertebræ Had we overlooked this fact we would have attempted a transvesical removal of the stone which of course would have been unsuccessful because the stone would not have been found

I mention these two cases as my personal experiences with this so-called retrograde movement of ureteral stones Doubtless this retrograde movement may take place in two ways When the stones are in transit down the ureter a certain amount of dilatation of the ureter takes place behind the stone If the stone is not very firmly fixed in the ureter and is not very large when the patient is placed in position for operation it is easy to see how the stone might fall back into the dilated ureter It is a well known fact that the ureter is capable of retrograde peristalsis so it may be that these stones are carried back up the ureter by retrograde peristalsis

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